

# RELATIONSHIP BETWEEN MOBILE NUMBER PORTABILITY AND CONSUMER CHOICE OF ACTIVE MULTIPLE MOBILE PHONE NUMBERS IN GHANA

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## ABSTRACT

*The use of multiple mobile phone numbers in Ghana has become a dominate phenomenon in recent years. The introduction of mobile number portability (MNP) makes it possible for a subscriber to conveniently switch from one mobile network to another without losing his or her number. Because of mobile number portability, we expected that use of multiple numbers would become less attractive. This study examines how mobile number portability has affected the use of multiple phone numbers. We use top, middle and lower level managers of both private and public formal sectors of the economy for examination. Thousands of multiple mobile phone number subscribers were surveyed from Accra where all the mobile networks operate and porting is well known. This study uses the mean and standard deviation to measure the relationship between mobile number portability and multiple phone number use. The study revealed low customer appreciation for mobile number portability, and customers' negative perception of service quality since introduction of mobile number portability. The article further showed weak or no relationship between number portability and use of multiple mobile numbers. Further, we show the introduction of number portability cannot be a panacea to the use of multiple phone lines even in the near future.*

**JEL:** M31, M38, M39

**KEY WORDS:** Consumer Choice of Active Mobile Numbers, Mobile Number Portability, Porting, Multiple Phone Numbers

## INTRODUCTION

Mobile number portability officially became operational in Ghana on 7<sup>th</sup> July, 2011, making it possible for mobile consumers to use service providers as they desire. As has been the custom of countries who previously implemented the facility, the push for mobile number portability implementation in Ghana was led by market regulators in an effort to provide mobile consumers the freedom to move between service providers. The eventual hope was it would lead to healthy competition in the mobile industry (Dewenter & Haucap, 2005; Kumaravel & Kandasamy, 2011). The implementation enables mobile phone subscribers to keep their phone numbers, including the network code even when they switch or port to another network.

Since its introduction in Singapore in 1997, the concept and practice of mobile number portability has attracted widespread research attention. Researchers have tried to investigate mobile number portability effects on brand changing behavior, switching costs, consumer satisfaction and loyalty on provider changing intention, portability and buyer switching intentions (Buehler and Haucap, 2003; Buehler, Dewenter and Haucap, 2005; Shin, 2006; Shin and Kim, 2008; Durukan, Bozaci and Dogan, 2011). Buehler and Haucap (2003) developed a mathematical model for the effects of mobile number portability on switching cost. The findings confirmed that mobile number portability is associated with switching cost. Shin and Kim (2008) studied the relationships between variables of customer satisfaction, switching intention, switching barrier, consumer loyalty, switching costs, quality of service and perceived price. The

study found that MNP had a positive correlation with customer satisfaction, customer switching intention and customer loyalty. MNP related inversely with switching barriers and switching cost. Vaghela (2012) did a study to investigate customer preference for mobile number portability. The study confirmed that mobile number portability increases customer awareness of competing products, and increases customer switching intentions. Furthermore, using the Indian Mobile Market, Kumaravel & Kaudasamy (2011) studied the impact of MNP on mobile users switching behavior. The results revealed the mobile operator's ability to retain its customers has a direct impact on its profitability and effectiveness. Similarly, Durukan, Bozaci & Dogan (2011) undertook an empirical analysis of mobile number portability and consumer switching behavior in Turkey and found that MNP introduction increased the mobile traffic rate, improves subscriber quality, and increased penetration rate.

The related literature illustrates the plethora of studies that have been done on mobile number portability. Yet, one obvious area of concern, which is under research, is how the introduction of mobile number portability impacts consumer choice of active multiple mobile telephone numbers. This exploratory study is significant because a primary reason for introducing MNP is to improve service quality. It was expected that this would reduce the use of multiple phone numbers as networks become more reliable (Keelson, 2012). The simultaneous use of multiple mobile phone networks in Ghana cannot be overemphasized. Studies on use of multiple phone numbers indicate that the phenomenon is a characteristic of mobile phone subscribers in Ghana. An estimated 15 million to 16 million people used 25,344,745 active mobile phone lines in Ghana as of November, 2012. This translates to an average of 1.7 to 1.6 mobile phone lines per subscriber. Similarly, Keelson (2012) revealed that over 40% of tertiary students in Ghana used more than one active phone lines.

Popularity of multiple phone line use may be because mobile phone subscribers, after using a particular line for a long time they find it difficult to stop using it because they become the source of long standing personal and business contacts. Thus, they like to maintain these lines even if the need for acquiring new lines emerge (Buehler & Haucap, 2004; Katka, 2004; Keelson, 2012). This compels subscribers to move from one service provider to another for better service, while maintaining their old lines.

We conceptualize that introduction of mobile number portability seeks to address this emerging challenge of subscribers using multiple mobile numbers. Implementation of mobile number portability in Ghana has intensified competition in the mobile telephony industry, compelling players in the marketplace to adopt competitive pricing and quality strategies. Since mobile number porting allows customers to switch without necessarily changing or losing their number, it is possible under the MNP regime for a subscriber to retain his mobile telephone number when changing from one network provider to the other (Haucap, BOhler & Dewenter, 2005; Buehler, 2007; Vaghela, 2012). This means with the introduction of the MNP, the use of multiple mobile numbers should be discouraged, as the facility improves network reliability. Thus, this paper explores the extent to which introduction of MNP has impacted on service quality and subsequently the use of active multiple mobile phone numbers. The remainder of the study considers review of related literature, data and methodology, results and discussions, and concluding comments.

## LITERATURE REVIEW

### Mobile Number Portability (MNP): The Global Perspective

The development and implementation of mobile number portability originated with Singapore in 1997 followed by Hong Kong and UK in 1998 and 1999 respectively (Buehler and Haucap, 2003; Kumaravel and Kandasamy, 2011). The facility continued to other Asian, European, American and African countries, including Netherland, 1999; Spain and Switzerland, 2001; Australia, 2001; Germany, 2002; USA, France

and Finland, 2003; Austria and Greece, 2004; South Africa and Morocco, 2006; Nigeria, 2007; Egypt, 2008; and Ghana, 2011.

Mobile number portability is a system that makes it possible for a mobile phone subscriber to switch subscription from one provider to another and retain the subscriber's phone numbers (Haucap, 2004). Since the facility allows consumers to switch service providers and yet retain their old mobile phone number, mobile service operators are required to actively compete, and provide innovative as well as improved customer service, if they would retain and expand their market share.

MNP is usually implemented in one of two ways. The first is where the consumer starts the process by contacting the current service provider (Donor Led Porting). The second system is the Recipient Led Porting, which involves contacting the new service provider. This system has been favored by most countries to be a more efficient and smoother process for consumers, (Buehler, Dewenter & Haucap, 2005; Shin, 2006; Shin & Kim, 2008). The process of porting involves a subscriber walking into the shop of the new network provider (Recipient), then the new network (Recipient) contacts the old network (Donor). The request is processed and the subscriber is ported to the new network, after the subscriber is informed of the successful porting and starts using the network.

The introduction of mobile number portability requires that network operators first identify all internal systems that would be influenced by this change and then resolve the system to use for routing the calls from an originating network to the mobile network associated with a given mobile number (Nilsson, 2006; Kumaravel & Kandasamy, 2011). Switching cost is identified as one of the major element associated with the use of mobile phone (Lin, Chlamtac and Yu, 2003; Haucap, 2004; Buehler, Dewenter and Haucap, 2005; Kumaravel and Kandasamy, 2011). Switching cost is real or perceived expenditures incurred when altering supplier but which are not incurred by remaining with the current supplier (Padila et al, 1995). Switching cost is a crucial factor that influencing firm behavior in the mobile telephony market (Kumaravel & Kandasamy, 2011). To address the full impact of switching cost associated with mobile phone service, regulators use mobile number portability to reduce switching cost and facilitate consumer choice and ensure effective competition (Sutherland, 2007). On the other hand, mobile number portability encourages churn, in which service providers try to put at an optimum level (Smura, 2004). Thus, Gans, King & Woodbridge (2001) suggested that implementation of mobile number portability thrives in a dynamic market with as many operators as possible. In such a market, regulators are able to work with a group of determined individuals who support the successful implementation of the facility.

#### Mobile Number Portability (MNP) in Ghana

On Thursday June 30, 2011, Ghanaian parliament adopted the report of the Committee on Subsidiary Legislation on Mobile Number Portability (MNP) Regulations 2011, Legislative Instrument (LI) 1994. By that action, MNP received the legal backing to begin. Mobile Number Portability (MNP) was launched in Ghana on 7th July 2011, enabling mobile subscribers to move from one mobile network to another, while retaining their mobile number (Haucap, 2004). There were 5 active mobile networks in Ghana: MTN, Tigo, Vodafone, Airtel and Expresso. The licensed Glo Mobile was yet to begin operations. The introduction of MNP has generated positive competition in the Ghana's mobile communications sector, compelling mobile operators to offer incentives to woo subscribers from other networks while keeping their existing subscribers (Dewenter and Haucap, 2005; Kumaravel and Kandasamy, 2011). Statistics by National Communications Authority (NCA) indicated that by July 18, 2011 over 6,000 subscribers had ported from one mobile network to another, with most of them being 'hassle-free'.

Smooth implementation of mobile number portability was due to the fact that Ghana, being one of the countries to recently adopting the MNP facility, had the opportunity to learn from previous implementations of MNP in other nations around the world. Thus stakeholders were able to identify most challenges associated with number porting, and carefully planned the MNP system to be successful by avoiding potential pitfalls. Since every facility has its own challenges, the National Communications Authority (NCA) in collaboration with mobile operators did institute measures to quickly resolve problems that arose. At the same time, some mobile providers opened special desks to manage MNP complaints.

The fastest port recorded so far in Ghana took place in a mere 1 minute, 31 seconds, with the average porting time for the first ten days being 4 hours, 17 minutes. This performance compared favorably with recent MNP implementations in other countries, where porting a mobile number can take up to seven days. Even in Europe, porting can take considerably longer than it does in Ghana, and the European Union is only now moving toward a 24 hour maximum, which has been the benchmark for Ghana since implementation of the facility. It took Ghana only 17 months to implement the MNP.

As indicated earlier, worldwide, MNP is usually implemented in one of two main ways. It involves either starting the process by contacting your current service provider (Donor Led Porting) or contacting the new service provider (Recipient Led Porting). Ghana has opted for the Recipient Led porting system. In Ghana, the network that the subscriber is switching to initiates the move. The subscriber only has to go to the recipient network or the network he or she wants to switch to and the switch is initiated. The fee for recipient networks is estimated to be \$2.5, while donor networks will incur about GH¢0.12 in costs. All mobile networks, excluding Expresso for now, have expressed their desire to absorb all costs for users who switch to their networks.

With the introduction of the MNP, all mobile subscribers qualify to benefit from the facility. The only reasons that may disqualify a consumer are: number not being active on the donor network, that is, the network that a subscriber is moving away from. Fraud having been reported; phone reported stolen; not enough of the ID items matching with the request. The request to port to a different operator may not be rejected in the case of debt still owed to the donor network. As at July 2013, as many as 800,000 subscribers have ported from one network to another. This shows the success of MNP's introduction in Ghana. Therefore, one would expect that with such successful implementation, MNP should be able to improve service quality and discourage the use of active multiple phone numbers.

This study aims at measuring the degree to which the introduction of MNP has discouraged subscriber use of multiple mobile phone numbers. To address this general objective, the following significant questions were necessary: 1) What is the degree of subscriber appreciation of MNP in Ghana? 2) What is consumer perception of service quality since the introduction of MNP in Ghana? 3) How does the introduction of MNP affect the use of multiple mobile phone numbers? 4) What is the future of multiple uses of phone numbers in Ghana?

## **DATA AND METHODOLOGY**

This exploratory research uses both primary and secondary research methods to address the information needs. To have a better conceptual framework secondary research was necessary since many studies have been conducted on mobile number portability. Also, primary data was needed because some variables used in this study were different from those of previous studies. Thus, survey was appropriate to confirm the reliability of existing variables, and to test the new variables which were used for the first time. Quantitatively, the survey method was the research instrument for the study. This was appropriate because certain information needed for the study were by nature numerical and could better be handled by

quantitative research instruments. Structured and undisguised questionnaires were used for survey data collection. Close-ended questions were used to limit the responses to specific and manageable items, and avoid possible exhaustive lists of items. In this connection, a 5-likert scale of strongly disagree to strongly agree, were used to measure the magnitude of respondents responses.

One thousand users of mobile phones were selected from managerial positions of both private and public sectors. Participants were surveyed in October 2013. All 1000 people were selected from Accra. For the purposes of the study, this was appropriate because unlike other areas where some mobile telephone companies do not effectively reach, all the mobile network operators have good coverage in Accra. Also most major companies are located in Accra, making it possible to sample views from managers from diverse business and social situations. The survey instrument is presented in Appendix 1. Research question 1 was answered by the use of frequency distribution method. Furthermore, mean and standard deviation were used to analyze the data for questions 2, 3 and 4.

One thousand survey questionnaires were administered to managers of both public and private sector organizations who use active multiple mobile phone numbers. Nine hundred and sixty two completed and usable questionnaire were received, constituting 96.2% response rate. The findings and their discussions are found below:

Gender, number of years one has been using multiple mobile numbers and individual respondent's organizations were used as respondent's details for the study. Tables 1 – 3 represent the findings of the profile of respondents. Table 1 presents findings on the gender of managers who participated in the survey. The results of Table 1 show that 501 females and 461 males respectively constituted respondents for the survey. This implies that more female managers use multiple phone numbers compared to their male counterparts. Similarly the findings of the study represent more views of females than males.

Table1: Gender of Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	461	47.9	47.9	47.9
	female	501	52.1	52.1	100.0
	Total	962	100.0	100.0	

*This table shows the sexes of respondents. Column two shows the frequency results of number of males against females, while column three shows the percentage of male respondents to female respondents. The frequency distribution table indicate that respondents were made up of 47.9% males as against 52.1% females*

Table 2 represents results of number of years respondents have been using multiple mobile phone numbers. As indicated by Table 2, over 50% of the respondents have used multiple phone number for five years and above. This suggests that the use of multiple mobile numbers in Ghana is historic in nature.

Table 2: Years Multiple Mobile Numbers Used

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 2 years	224	23.3	23.3	23.3
	2 - 4 years	256	26.6	26.6	49.9
	5 or more years	482	50.1	50.1	100.0
	Total	962	100.0	100.0	

*This table shows the number of years respondent has been using multiple phone numbers. Column two shows the frequency results of number of a respondents has been using multiple numbers, while column three shows the percentage of use. The frequency distribution table shows that 23.3% have used multiple numbers for less than 2 years, 26.6% have used up to 4 years and 50.1% have used for at least 5 years*

Table 3 shows whether a respondents is working in the public sector or the private sector. Another significant detail of the respondents were that more public sector workers were involved in the study

relative to those from the private sector. The relationship was 63.5% and 36.6% for public and private sector respectively.

Table 3: Respondent's Organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Public	611	63.5	63.5	63.5
	Private	351	36.5	36.5	100.0
	Total	962	100.0	100.0	

*This table shows whether a respondents work in the public or private sector. Column two shows the frequency results of respondents from public and private sectors, while column three concern itself with the percentage public sector workers against private sector workers. The frequency distribution table shows that 63.5% of respondents were from the public sector and 36.5 were from the private sector*

## RESULTS AND DISCUSSION

### Degree of Subscriber Appreciation of the MNP in Ghana

This section presents and discusses the extent to which mobile phone users apply the number portability facility since its introduction in the country. Table 4 below depicts the results. The mean of 2.66 and SD 1.036 indicate that mobile phone users' knowledge of MNP was centered between 'knowing much' and not 'knowing much'. Thus mobile subscribers' knowledge of MNP is just around average. Regarding subscribers' use of the porting facility, the results show very low usage. The mean of 3.01 implies that mobile phone subscribers are not taking advantage of the MNP, while the standard deviation of 0.996 suggests that the attitude toward the use of mobile number porting facility is almost the same among subscribers. The results further illustrate that mobile customers have some amount of technical knowledge to port if they want to. This is explained by the mean of 2.60 and SD 0.717, which indicates that subscribers are either able or somehow able to technically port. However, the results also suggest there is not much subscriber education on the introduction and use of mobile number portability. This is supported by the mean of 2.97, which lies close to the 'not much of 3. The standard deviation of 0.936 also shows that almost all the responses hover around not receiving much education.

From the Table 4 we see that consumers' appreciation with regards to knowledge of porting and ability to port are about average, while that of frequency of porting and education received on porting are below average. This suggests that consumers overall appreciation of the coming into force of the mobile number portability is not encouraging.

Table 4: Mean and Standard Deviation Statistics

		Knowledge of MNP	Frequency of Use of MNP	Technical Ability to Port	Education on MNP
N	Valid	962	962	962	962
	Missing	0	0	0	0
Mean		2.66	3.01	2.60	2.97
Std. Deviation		1.036	.996	.717	.936

*This table shows the degree of consumer appreciation for Mobile Number Portability by private and public sector workers. The mean and standard deviation results show above average knowledge, but relatively low frequency of use, below average technical know-how on use and below average education on the use of Mobile Number Portability in Ghana*

### Consumer Perception of Service Quality

In this section we present data presentation and interpretation on how subscribers of mobile phone services in Ghana perceive service quality delivered by the mobile network companies, especially after the coming into force of mobile number portability. The results are shown in Table 5.

The results in Table 5 are a reflection of the fact that consumer perception of the competitiveness of the call rate is just about average. The mean of 3.44 shows that consumers either agree or in some cases not sure of the competitive nature of the mobile call rates in Ghana. Almost all respondents share the same view as indicated by the standard deviation of 1.330. Also, consumers are almost indifference about the erratic nature of the mobile network services. The descriptive statistics results showed a mean of 3.21, which lie between consumers’ being ‘indifferent’ and ‘agreeing’ that the service is erratic. This means that while consumers think the supply is erratic, they are careful to express it. Regarding network coverage, consumers could not fully agree whether coverage is wide enough. The mean of 3.32 and SD 1.336 suggest that network coverage is still a little below average in most cases. It is also significant to note that consumers believe that mobile network companies are not doing much to manage customer complaints. The mean of 2.77 implies that while some subscribers disagree with the manner in which complaints are handled others are indifferent. This means consumers have a negative perception about complaint management by network companies. The standard deviation of 1.183 indicates that respondents have almost the same view. Finally, consumers do not see much improvement in the quality of service since the introduction of MNP. The mean of 2.81 and SD 1.237 suggest that the majority of mobile phone users are either unhappy with the quality of service or cannot say if the service is any better.

In sum, we conclude from Table 5 that consumers of mobile phone services have a negative perception about service quality. The results show that consumer expectations were not met in any of the five scales used to measure consumer perception of service quality. The results suggest that introduction of mobile number portability has not yet contributed to improvement in perceived service quality.

Table 5: Mean and Standard Deviation Statistics

		Competitiveness of Call Rate	Erratic Nature MNP	Network Coverage of Service Providers	Response to Complaints	Customer Service Since Introduction of MNP
N	Valid	962	962	962	962	962
	Missing	0	0	0	0	0
Mean		3.44	3.21	3.32	2.77	2.81
Std. Deviation		1.330	1.203	1.336	1.183	1.237

*This table shows respondent’s perception of service quality since Mobile Number Portability was introduced in Ghana. The mean and standard deviation results show multiple mobile users have negative perception about the competitiveness of call rate, extent of network coverage, suppliers’ response to complaints and customer service. Also, multiple mobile users are concern about the erratic nature of number portability.*

### Relationship between Number Portability and Choice of Multiple Phone Numbers

The manner in which subscribers believe the introduction of mobile number portability could influence their decision to continue using or stop using multiple mobile numbers is discussed in this section. The findings are presented by Table 6. Results show consumers do not think they have any reason to use one mobile number because of the introduction of mobile number portability. The mean of 2.72 and SD 1.165 indicate that most consumers are either not going to stop using multiple numbers or not too sure of what to do with multiple number after the introduction of mobile number portability. Secondly, consumers were almost indifferent as to whether number portability should be a substitute for use of multiple mobile lines. The findings showed a mean of 3.21, which indicates that while some agree that with the porting facility they can concentrate on the use of one line, others were not too sure whether that is a good option. The standard deviation of 1.292 also shows that consumers preference to use one line and port when necessary compared to using multiple lines is between agree and neutral, indicating little or no deviation from majority view. Thirdly, the ability to switch from one number to another is not encouraging enough to consumers to stop using multiple mobile lines. The descriptive findings revealed a mean of 3.21 and SD 1.188, suggesting that while a number of consumers believe that once you have the technical ability to port you may not need to use multiple phone lines, an equal number are not sure whether the ability to port should determine the use of multiple phone lines. Fourth, consumers could not fully agree whether

there are more superior factors influencing their choice of multiple phone line. This is shown by the descriptive results of mean 3.32 and SD 1.201. These findings indicate that as many consumers agree there are some superior determinants factors of using multiple phone lines, as there were those who could not be sure whether there were any such superior factors or not. Finally, there was some level of agreement among users of multiple mobile numbers that portability is good but should not stop one from using multiple lines. The mean of 3.39 and SD 1.169 show that a majority of respondents either agree to the view or were not too sure of themselves.

We conclude from Table 6 that there is weak correlation between mobile number portability and consumer choice of multiple mobile phone lines. This suggest that porting may not be the best marketing practice to minimize the use of multiple mobile phone lines in Ghana, at least for now. Apparently introduction of number portability has neither seen serious appreciation nor improved service quality.

Table 6: Mean and Standard Deviation Statistics

		Use of Multiple Network after MNP	Desire to Use More Network Than One	Ability to Switch Determine Number of Network	Superiority of Multiple Use to MNP	How Benefit of MNP Affect Use of Multiple Lines
N	Valid	962	961	961	962	961
	Missing	0	1	1	0	1
Mean		2.72	3.21	3.21	3.32	3.39
Std. Deviation		1.265	1.292	1.188	1.201	1.169

*This table shows the relationship between the Mobile Number Portability and consumer use of multiple mobile phone lines. The mean and standard deviation results show that even after introduction of number portability, multiple use of mobile phone is still not declining; the desire to use multiple phone is also not going down, consumers consider multiple use of mobile phone ahead of using number portability.*

### Future of MNP and Choice Multiple Phone Numbers in Ghana

The predicted effected of the introduction of MNP on the future use of multiple mobile numbers in Ghana is ascertained. The results is presented in Table 7. The results show a gloomy picture about the future of mobile number portability and the choice of multiple mobile phone networks. Consumers have low belief that continuous application of number portability can reduce consumer choice of multiple phone lines. The mean of 2.62 and SD 1.292 show that respondents were between disagreeing that use of multiple phone lines will cease with increasing application of number portability and being indifferent. This means that consumers hardly expect that increasing application of number portability is anything to stop the future use of multiple phone lines. Again, the results indicate that despite the introduction of MNP, consumers somehow expect that the use of multiple mobile phone lines will rather increase in Ghana with time. This is depicted by the mean of 3.21, which is between agree ‘4’ and neutral ‘5’. Furthermore, consumers do not perceive the growth of MNP to potentially have any future consequences on choice of multiple mobile phone numbers.

The above results suggest that mobile number portability is not a panacea to discouraging multiple use of mobile networks in the future. Consumers rather expect multiple uses of phone lines to increase if number portability is the only factor to discourage the use. Thus, in the near future choice of multiple mobile phone numbers will not have anything to do with the existence of number portability.

### **CONCLUDING COMMENTS**

The purpose of the study was to establish the relationship between mobile number portability and consumer choice of active multiple mobile numbers. Using survey methods, with Likert Scale questions, data were collected from 1000 managers of public and private institutions in Ghana. The data were then analyzed using frequency distribution, mean and standard deviation as statistical tools. The results



indicated that there is relatively good consumer appreciation of the existence of mobile number portability. Also consumer perception of number portability seemed quite positive. The study showed a negative correlation between number portability and multiple uses of mobile phone lines. It further showed no relationship between the growth of use of number portability and minimization of multiple phone line use in the future. We conclude that porting might not be the best marketing practice to minimize the use of multiple mobile phone lines in Ghana. Similarly, as long as the introduction of number portability continues to be less appreciated it shall be a challenge to use that as a means to discourage multiple phone line use. Again, consumers’ negative perception of service quality since the introduction of number portability could be translated to mean that consumers believe that use of multiple phone lines is the means to address the poor services of mobile networks and not porting. In sum, the study found no statistical relation relationship between mobile number portability and service quality, and subsequently, consumer choice of multiple mobile phone number.

Table 7: Mean and Standard Deviation Statistics

		Appreciation of MNP and Use of Different Lines	Expectation of Future of Use of Multiple Lines	Can Portability Discourage Use of Multiple Lines
N	Valid	962	962	962
	Missing	0	0	0
Mean		2.62	3.21	3.29
Std. Deviation		1.292	1.175	1.215

*This table shows the relationship between the Mobile Number Portability and future use of multiple mobile phone lines. The mean and standard deviation results show that consumers will continue to prefer use of multiple mobile numbers to number portability. Thus expectation of future use of multiple mobile numbers seems to be in the ascendancy. The results also show the emergence of number portability cannot be a panacea to multiple uses of mobile numbers.*

We emphasize that use of multiple phone lines go with both economic and social costs (Keelson, 2012), which have implications for the user and the regulator of mobile telephony in Ghana. It is therefore relevant that the introduction of MNP live to its bidding by ensuring quality service. In this case consumer appreciation in the number portability facility will increase. This shall discourage use of multiple phone line now and in the future. This will require that education on the use of number portability is heightened to inculcate the regular use of porting to register displeasure of poor service, instead of using multiple phone lines. The regulators of mobile telephone companies must also attach number portability with some standards of quality service. This will provide consumer confidence in the number portability facility, which may not only be used for its sake but as a means of showing disloyalty to non-performing companies.

The results of the study suggest there may be factors that influence consumer choice of multiple phone lines other than number portability. Future studies may try to identify factors that directly influence the choice of multiple mobile numbers. Also this study used only 1000 managers from public and private sector. The limitation is the view may not represent the over 17 million users of mobile networks in Ghana. Again, the study used frequency distributions and means with standard deviation as statistical techniques. While these are not bad in themselves, a use of techniques such as correlation and regression analysis might be superior to establish the relationships. Thus, future studies may consider using a bigger and wider sample that can cover a whole spectrum of the economy. It is recommended that since introduction of mobile number portability does not seem to be the panacea to continuous use of multiple mobile numbers, research must be carried out to find the primary reasons behind the use of multiple mobile phone numbers. This should heighten attention into the study of use of multiple phone numbers with the aim of discouraging the practice with its associated cost, social and psychological implications.

## APPENDIX: RESEARCH QUESTIONNAIRE

Dear Respondent you have been selected among 999 other officer for a survey to investigate *the relationship between mobile number portability and consumer choice of multiple mobile phone numbers*. Your honest and frank response shall be very much appreciated.

### Instruction

Please tick [] one appropriate response from the sets of responses for the questions below:

### Respondents Profile

1. Gender Male  
[  ] Female [  ]
2. I have used multiple mobile phone numbers for:  
Less than 2 years [  ] 2 – 4 years [  ] 5 or more years [  ]
3. Organization  
Private [  ] Public [  ]

### Subscriber Appreciation of the MNP in Ghana

4. How much do you know about mobile number portability?  
Very much [  ] Much [  ] Not much [  ] Not at all [  ]
5. How often do you use mobile number portability facility?  
Very often [  ] Often [  ] Not often [  ] Not at all [  ]
6. How would you describe your technical ability to port from one network to another?  
Very able [  ] Able [  ] Somehow able [  ] Not able [  ]
7. How much education have you personally received on MNP?  
Very much [  ] much [  ] Not much [  ] Not at all [  ]

### Consumer Perception of Service Quality

8. The mobile call rate is very competitive these days  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
9. The supply of mobile service is still erratic  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
10. No mobile phone service provider still cover covers all the places I usually go in the country  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
11. Response to customer complaints has improve since the introduction of MNP  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
12. Customer services in general has improved since the introduction of MNP  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]

### Relationship between Number Portability and Choice of multiple Phone numbers

13. With the introduction of mobile number portability, I see no reason for using more than one phone  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
14. I prefer to use more than one phone services than to use one number and switch when necessary  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
15. I do not think the ability to switch with the same number should determine the number of phone numbers I use  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
16. My reasons for using multiple phone numbers are far superior than just number portability  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
17. Mobile number portability is good but I do not think it should affect the number of phones one choose to use  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]

### Future of choice of MNP and choice multiple phone numbers in Ghana

18. I foresee that as more people continue to appreciate MNP, the use of multiple lines will cease  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
19. I expect the use of multiple mobile numbers to increase in the coming years  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]
20. I do not think MNP has any potential to discourage the use of multiple phone numbers  
Strongly disagree [  ] Disagree [  ] Neutral [  ] Agree [  ] Strongly agree [  ]

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