

# **Analysis of Competitive Behavior within Ghana's Mobile Telephony Industry**

**King A. Salami**  
**Central University College Business School, Accra**

*The study seeks to examine the competitive behavior within Ghana's mobile telephony industry. With survey data collected for the purpose, an analysis was done employing simple cross tabulations using a Spreadsheet software program. Among the conclusions reached were that, Ghana's mobile telephony industry appeared to be oligopolistic; that, the providers adopted non-price competitive practices; and also that call-drops, difficulty in placing calls, and relatively higher tariffs were almost the order of the day. Among the resulting recommendations were that there should be enough and proper policing of the sector to forestall the possibility of adopting cartel or collusive practices that could be to the detriment of the helpless subscribers; and that the NCA must provide answers to the question of expertise which is a critical challenge to effective functioning of the set up.*

## **INTRODUCTION**

Ghana's mobile telephony industry consists of the service providers, the Government represented by its agent, the National Communication Authority (NCA) with responsibility for regulatory functions and powers to ensure that sanity prevails within the industry, and the subscribers who can make or break the service provider. The fact that subscribers who are business executives, public sector workers, students, workers in academia, hawkers, farmers, and even the jobless and scavengers are all users of mobile phones provides some indication of the importance of mobile phone technology in the conduct of their daily lives and businesses.

Think Ghana (2010) has indicated that the mobile telephony sector in Ghana is getting interesting and hotter with the growth in number of service providers all eager to increase the subscriber base. The number of mobile phone users has multiplied by the day. A current conservative estimate of 11million mobile phone users exist in Ghana out of a total estimated population of 22 million people. It has further been reported that the records of Ghana's National Communication Authority (NCA) show that there has been an exponential growth in the number of mobile subscribers from about 7.6 million in January, 2008 to about 11.3 million by the end of the same year. This has been due to aggressive marketing strategies and the introduction of new and innovative products by the providers, resulting in the apparent 50% tele-density achieved so far. Ghana Business News (2009) has commented on the phenomenal growth within the industry and states that among 40 Ghanaians with mobile phones, only one has a fixed line, putting the ratio at 40:1. The implication is that Ghanaian mobile phone users now regard the mobile phone as a far more important communication tool than fixed line phones.

There are currently six mobile phone providers in Ghana, even though only one existed in 1992. This appears to confirm the Structure-Conduct-Performance (SCP) Paradigm, which states that an industry is

never static but always changing in structure (the number of firms in an industry), the way it conducts its business, and the resultant performance in terms of profitability, etc (Moschandreas, 2000; Cook. et al,1998, pp.365; Reekie, 1989).

On average, there has been positive growth in the overall Ghana's mobile telephony industry. Despite such a phenomenal growth and intense competition among the service providers, the industry is reported to be beset with varied and numerous problems. Among these, are poor reception, break in initial calls, unannounced break in transmission (call drops), and the high cost of making calls. These problems are apparently being voiced out by the various groups of mobile phone users; some have even pointed at the National Communications authority (NCA), Government agent, as a weak regulatory institution that has compromised on its mandate, to the disadvantage of subscribers.

The overall aim of the study is to analyse the competitive environment of Ghana's mobile telephony industry and come out with any related policy recommendations that could positively help to move the industry forward. Specifically, the study objectives are to:

- examine the operations by the service providers in terms of service quality;
- assess the opinions of the subscribers; and
- examine the role of the National Communications Authority (NCA) within the industry.

The study is of significance to a wide range of stakeholders, among whom are the subscribers from all walks of life, with varied issues and concerns of efficiency and costs; the providers who seek after profit but must never be seen to take the subscribers for granted; and the government through the NCA that must be seen by the public not to be compromising on their regulatory role and mandate; and lastly, the entire economy supposed to benefit from the developmental role of the industry through multiplier effects.

The study used data mostly collected from the nation's capital city of Accra where the interviewing of relevant respondents was conducted. It may therefore be said that the paper has limited scope. But the views expressed by the respondents may be considered to be representative in the sense that the city of Accra which is the nation's capital has a very high concentration of mobile telephony usage in Ghana and it is the location where all the service providers can be identified.

The remainder of the study is considered under: Review of relevant Literature (section two); Methodology, in connection with data collection and processing (section three); Analysis of processed data and discussions (section four); and lastly Conclusions and Policy recommendations (section five).

## **LITERATURE REVIEW/CONCEPTUAL FRAMEWORK**

Ghana's mobile telephony industry can be analysed within the context of an oligopolistic market model. Here, such a market or industry is characterized by a small number of firms that are reasonably large, and with a great deal of interdependence, actual or perceived, existing among them. Each firm in the industry formulates its policies bearing in mind their effects on its rivals. For example any change in the firm's price or output has an influence on the sales and profits of competitors. Some of the reasons for oligopoly have been stated as: economies of scale; higher entry barriers due to very large requirements; and defensive and offensive strategies so as to weaken competitive pressures. The theory of oligopoly has been described to be so complex that it is difficult to have a single model to explain it. Mansfield (1982, pp.330-357) has provided a number of models to explain oligopolistic market behavior. One classification could be collusive oligopoly (characterised by collusion/cartel) and independent oligopoly.

Our study falls under the independent oligopoly market structure, with an adaptation of the Kinked Demand Curve Theory. Several varied models exist under independent Oligopoly such as the Cournot model, the Edgeworth model, the Chamberlain model, the Sweeney model popularized by the Kinked Demand Curve, and the Games Theory. The Kinked Demand Curve is regarded as a popular theory designed to explain prices rigidity in oligopolistic markets. The theory asserts that, if an oligopolist cuts price, it can be pretty sure that rivals will act likewise; but if it increases price it is likely to find that rivals

will not change their prices. Some examples of this theory can be seen to be in operation within Ghana's mobile telephony industry.

Several authors like Haucap (2003), Kapur (2004), Salami (2008) and Grzybowski (2008) have made important contributions to existing research in the area. For example, Haucap (2003) has analysed the operations of the market and the justification for regulatory intervention, but has cautioned against sector specific regulation. Kapur (2004) has looked at competition issues such as number portability, pricing and price regulation, but Salami's study (2007) concerned oligopolistic practices in Ghana's banking industry in relation to efficiency. Grzybowski's (2008) assertion is that the liberalization of fixed telephone lines and the introduction of mobile phone number portability tend to increase competition in the mobile phone industry.

It is difficult to estimate the effects of an oligopolistic market structure on price, output, and profits because there is no agreement on any particular model as an adequate general representation of oligopolistic behavior. But some effects on prices, outputs and profits may be considered. Prices tend to be higher and more inflexible than under perfect competition. Output tends to be less because the demand curve is assumed to be steeper than under perfect competition. Besides, oligopolistic industries tend to spend large amounts on advertising and product variation (differentiation). Profits tend to be higher than those earned by perfectly competitive firms, a fact supported by empirical evidence.

Hoff (2006), Abraham (2007), and Kwakye (2006) provide some interesting information on the mobile telephony industry. Hoff (2006) reports a flurry of activities in the mobile telephony operations of several African countries, including Nigeria, characterized by very keen competition and market instability. Anyimadu (2005) and Abraham (2007) comment on the potential benefits of the mobile telephone industry. Abraham cautions that the potential efficiencies are dependent on easy access to capital, especially the production end of the supply chain, without which the market remains less efficient than could be the case. Using a case-study of the fishing community from India, he identifies such potential benefits as:

- The ability of fishermen to respond quickly to demand, thus preventing unnecessary wastage of catch;
- More effective coordination of supply and demand at the marketing end to reinforce merchants and transporters ability to take advantage of the free flow of price information;
- Ensures less wastage of time and resources in all segments of the fishing community, making the market more efficient with the reduction of risk and uncertainty;
- Greater market integration resulting in productivity gains, and sum of consumer and producer surplus (the Marshallian surplus);
- Reduction in price dispersion and price fluctuations; and
- Improvements in the life of the fishermen.

A case study by Kwakye (2006) on Ghana Telecom, whose new name is VODAFONE (since 2009), in contrast to Abraham (2007), reports that the firm is bedeviled with major corporate and management problems. He adds that, in Ghana, there is a combination of a weak regulator and service providers who are interested in price gauging than the provision of high quality service to subscribers, thus constraining the development of a robust mobile telephony industry. He further describes the NCA as a moribund government entity, unable to regulate the service providers, leading the providers to operate with impunity. The fact is that, even though most wireless phone users are extremely unhappy with the services of the providers, they appear helpless and at the mercy of inefficient mobile service operators. This situation is compounded by the providers who sell more GSM SIM cards to the subscribers more than their network available capacity, a situation tantamount to highway robbery. Buttressing the findings of Kwakye (2006), Nyarko (2007) also reports numerous complaints in connection with inter-connectivity and poor network services that have made it impossible for subscribers to route their calls through one of the operators to the other.

Hamilton (2003) and Ghana Business News (2009) discuss whether mobile phones and fixed phone lines are substitutes or complementary and tend to suggest that mobile phones act as a competitive force encouraging fixed phone providers to improve access, even though it is sometimes possible the two can act as substitutes in consumption. Public Agenda (2008) looks at options to make the industry a viable, efficient and competitive sector that is able to contribute to the country's economic development. It comments that the industry must be viable, innovative and sensitive to the needs of subscribers to facilitate socio-economic development, which implies the harnessing of the potential of mobile phones through the building of bridges among all players in the industry.

As a regulator of the industry with responsibility for an efficient and effective promotion of a telecommunications sector that is able to contribute to Ghana's economic development agenda, the mission of NCA (2008) is to regulate the industry through setting and enforcing high standards of competence and performance to be able to make significant contribution to Ghana's prosperity by means of promoting and enforcing efficient competitive services.

The implication of the above relatively brief review is that it provides us with the basis on which to move forward in the next stages of the study, data organization, and data analysis and discussions.

## **DATA ORGANISATION**

Our study used both primary and secondary data. The internet, books journals provided the sources for secondary information, while face-to-face interviews through the medium of structured questionnaires helped in primary data collection. Data collection was organized at three levels: the mobile phone provider level; the subscriber level; and at the level of the National Communication Authority (NCA). The purpose of this grouping is to enable us properly address the original objectives of the study.

At the level of the provider, questionnaires were used to collect primary information through questionnaire administration. KASAPA and ZAIN managed to cooperate in this task, but the rest (MTN, TIGO and VODAFONE) referred the researcher to their web sites, as well as other relevant publications. The questionnaire was designed with the original objectives in mind. At the level of the subscriber, questionnaires were also used to gather appropriate information through face-to-face interviews. 200 subscribers were interviewed, purposefully selected and from different areas of Accra so as to make the data representative. Other relevant publications were also consulted to enrich the results of our interview administration. Lastly, information on the NCA was obtained through both structured questionnaire administration and other relevant publications. Information collected through questionnaire administration was processed by the help of simple spreadsheet application. The results of the output in the form of charts and figures were used in the analysis and discussions of the study.

## **ANALYSIS AND DISCUSSION OF THE PROCESSED DATA**

Table 1 reveals interesting statistics on the subscriber base of different providers. For example, ZAIN, though a very late comer starting commercial operations in early January, 2008, has managed within a period of twelve months, to register 267,808 clients, constituting a phenomenal 100% growth. Such a success by ZAIN has been reported to be due to their innovative roll-out strategy – the ZAIN Reserve number system, and subscribers' expectations of higher quality services that might be offered by ZAIN in comparison with the services by the other providers. The other providers are the MTN, TIGO, VODAFONE, KASAPA, ZAIN, and GLOBACOM (GLO). KASAPA started commercial operations in 1995 but has not enjoyed any dramatic growth. This may have been due to the problems of in-fighting among the top leadership, and the analogue technology being operated, as against the GSM technology of the others that are seen to be more modern. The three largest providers, MTN, TIGO and VODAFONE add up to a Concentration Ratio of 95%, an indication that Ghana's mobile telephone industry is really oligopolistic, implying that the NCA must work hard and wake up to the exercise of its mandate to ensure that these providers do not resort to cartel/collusion practices to the disadvantage of subscribers who are

often powerless in the face of monopolistic tendencies. MTN's share of the total market is 56%, followed by TIGO's 24%, and VODAFONE's 14%, using figures provided in Table 1.

**TABLE 1**  
**GROWTH IN SUBSCRIBER BASE OF SERVICE PROVIDERS IN 2008**

Service provider	Jan 2008	Dec 2008	Growth in number	% growth
MTN	4,016,132	6,428,218	2412086	60%
TIGO	2,023,091	2,741,122	718031	35%
VODAFONE	1,275,764	1,592,451	316687	25%
KASAPA	289,066*	394,081*	107985	37%
ZAIN	Started commercial operations, Dec. 2008	267,808*	267808	100%
GLOWBACOM	Commercial operations not yet started	---	---	
Estimated Total	7,604,053	11,423,680	3819627	50%

Source: Think Ghana (2009); and researcher's own calculations

\* Figures relate to 2009 Concentration Ratio is 95% (ie the total market power of the three: MTN, TIGO and VODAFONE)

Analysis of the results of the questionnaires at the level of providers indicates that each provider considers the others as keen competitors. For example, KASAPA in its response to a question described the competition among providers as 'severe and killing', while ZAIN's response was that the market was 'entertaining and challenging'. The rest stated that they considered the market very competitive, but were equipped to the challenge, such as continuous innovation and improved technology and products so as to achieve costs reduction and sustain market shares. For example, TIGO explained their focus to be on product innovation and competitive pricing, as well as heavy investment in marketing and promotion to establish a strong presence in terms of brand awareness. The others provide similar tactics as efforts to sustain their market shares. All the providers agreed that they were not too keen on the use of price competition which could produce market instability. But the weapon often used is non-price competition through special promotions and other new and innovative products. For example, ZAIN launched a special three-month promotion in the early part of 2009 in connection with the chance to visit World Cup Football competition in South Africa; and this was followed by VODAFONE between September and November, 2009, in connection with the opportunity to win a Mitsubishi 4X4 motor vehicles by relevant subscribers. Then TIGO also followed by launching a promotion in connection with the opportunity to win GHc.30,000 by relevant subscribers. These various forms of non-price competitive practices have been reported as very successful. In response to a question about their relationship with the NCA, they all reported cordial relationship, but expressed that the laws and regulations they have to work with were too many and needed to be streamlined to make them be effective.

Analysis of subscriber data reveals interesting results. Simple Cross Tabulations using Microsoft spreadsheet applications were employed in the analysis. Table 2 provides information on Usage of different networks (providers). About 40% of the interviewees used three providers (MTN, VODAFONE and ZAIN); 20% used two networks, that MTN and either VODAFONE or ZAIN; 40% used MTN alone. These figures seem to indicate the wider usage and coverage of MTN, which does not necessarily translate into higher efficiency and higher quality service as can be verified in Table 4. Table 3 provides information on reasons for choice of provider (network). Service quality appears to be the leading reason for subscribers' choice of a particular network, accounting for about 80% of total sample of 200 subscribers. This may also account for why some subscribers choose two or three networks, in search of service quality, which is apparently eluding them. Information on efficiency/quality rating of network is

provided in Table 4. ZAIN is identified with High quality service by 60% of the sample while MTN's rating is at the bottom, signifying Very Low service quality in terms of easy and fast initial connection; low call-drops; low tariff; etc. When subscribers were asked why they were still stuck with MTN when they had other options, majority with two or more networks explained that they had been with MTN for very long and most of their contacts were familiar with the MTN number and therefore found it very difficult to completely change from MTN. This thinking leads us to the significance of phone number portability which the NCA is currently exploring. It will obviously be one way of improving the efficiency of providers.

**TABLE 2**  
**USAGE OF DIFFERENT NETWORKS**

<b>Year: 2009</b>		<b>Sample size: 200 subscribers</b>
<b>Usage of network</b>	<b>Number of subscribers</b>	<b>percentage</b>
<b>Users of 3 networks (MTN; VODAFONE; ZAIN)</b>	80	40
<b>Users of 2 networks (MTN; VODAFONE or ZAIN)</b>	40	20
<b>Users of 1 network (MTN)</b>	80	40

Survey data (2009)

**TABLE 3**  
**REASONS FOR CHOICE OF PROVIDER (SUBSCRIBER)**

<b>Year: 2009</b>		<b>Sample size: 200 subscribers</b>
<b>Reason</b>	<b>Number of Subscribers</b>	<b>Percentage</b>
<b>Easy to obtain contract</b>	10	5
<b>Non-price benefits (promotional packages, etc)</b>	30	15
<b>Service quality (low call-drops; easy and fast call connection; low tariff; etc)</b>	160	80

Source: Survey data (2009)

**TABLE 4**  
**RATING OF NETWORK (PROVIDER) EFFICIENCY IN TERMS OF SERVICE QUALITY**  
**(1=High; 2=Average; 3=Low; 4=Very Low, Sample size: 200)**

<b>Provider (Network)</b>	<b>Rating by Subscribers</b>	<b>Response Percentage</b>
<b>ZAIN</b>	1 (High)	55% responded high quality service
<b>TIGO</b>	2 (Average)	20% responded high quality service
<b>VODAFONE</b>	3 (Low)	10% responded high quality service
<b>KASAPA</b>	3 (Low)	10% responded high quality service
<b>MTN</b>	4 (Very Low)	5% responded high quality service
<b>GLOW</b>	N.A	N.A

Source: Survey data (2009)

Some specific cases need to be reported so as to place the issue in the right perspective. For example, Harunah (2009), reports of the inefficiencies of mobile communication in Ghana, and writes that "I have

not come across mobile network that touts its huge customer base without doing much to keep them. The kind of service MTN is providing its subscribers is poor and mediocre. It should not take its customers for granted that they will continue to purchase MTN minutes although they are experiencing a lot of anger with daily mediocrity". The fact is that all subscribers interviewed share similar feeling and experience. Many have also identified VODAFONE as another culprit in Ghana's mobile telephony industry. In a study by NCA (2007), it was revealed that service quality was the main determinant of choice of provider, and that about 68% of subscribers interviewed admitted that they experienced difficulties in their last ten attempts at making calls. What is tantamount to sub-standard service by the providers has also been reported by Kwakye (2006) and Nyarko (2007) in their studies.

The NCA has responsibility for regulating Ghana's telecommunications sector and implementations of the terms of related Policy. Among the regulatory functions and roles are:

- Issuing of licenses, establishing terms and conditions
- Regulation of competition, including interconnection;
- Allocation of scarce resources, including management of the frequency spectrum
- Implementation of Universal access policy
- Tariff regulation consistent with Ministry policies
- Consumer protection.

Our analysis of the NCA appears to indicate that the organization has a great deal of room for improvement to be able to live up to its mandate. An interview with relevant officials revealed that the organization is lacking in expertise in number and quality. The fact is that there is in existence a large body of documentation such as laws, regulations and procedures, but the implementation by way of oversight responsibilities over the providers is a critical challenge that requires vigorous attack and solution. One study, for example, writes that "the NCA seems to simply give licenses to mobile companies to operate. They even lack the necessary clout to get these companies to meet the requirements for their operations such as providing quality services for their subscribers...It has always been seen as a toothless bulldog....But it is yet to be seen, whether they can really bite, because, there is strong suspicion among Ghanaians that the companies are still increasing their subscriber base" (Dogbevi, 2008). Majority of subscribers talked to in this exercise appear to be of this view.

## **CONCLUSIONS AND POLICY RECOMMENDATIONS**

The foregoing has resulted in a number of conclusions. Firstly, Ghana's mobile telephony industry can be described as an independent oligopolistic industry, with the three larger one, the MTN, TIGO and VODAFONES accounting for about 95% Concentration Ratio. Secondly, the providers tend to adopt non-price competitive practices as against straight price competition that could result in market instability and consequently, loss of market share. Thirdly, subscribers are not too pleased with the activities of the providers. The services being sold to them are considered to be of poor quality. Call-drops, difficulty in placing calls, and relatively higher tariffs are almost the order of the day. Finally, the NCA is being called upon to properly exercise its mandate to ensure all regulatory roles and functions are effectively implemented, because its current activities leave a great deal of room for improvement due to the fact that it lacks the necessary expertise in terms of quality and number.

The following recommendations have flowed from the above. There must be enough and proper policing of the sector, especially because of the 95% Concentration Ratio accounted for by the three large providers so as to forestall the possibility of adopting cartel or collusive practices that could be to the detriment of the helpless subscribers. In this connection, the NCA must surely be seen to have the teeth to bite as and when the need arises. The effort being made recently by the NCA in relation to mobile number portability is surely the right step in the right direction, and must be stepped up. Secondly, the providers must begin to take the subscribers seriously, and never to forget the fact that at the end of the day the sustainability of their organizations depends on these seemingly powerless subscribers. They must

therefore note and update the comments, suggestions, grievances, etc through frequent meetings with the subscribers to ensure major differences are ironed out before getting out of hand. Finally, the NCA must provide answers to the question of expertise which is a critical challenge to effective functioning of the set up.

This study has not attempted to exhaust all aspects of Ghana's mobile telephony industry. In this connection, future research interests could be in the direction of assessing the economic impact of the sector, relationship between the fixed line and the mobile phones, assessment of the social responsibility role of the industry, etc. This direction could help us to fully appreciate the immense roles of the industry.

## REFERENCES

- Abraham, Reuben (2007) "Mobile Phones and Economic Development: Evidence from the Fishing Industry in India" retrieved Dec 10, 2009 from //www.Mobile Phones and Economic Development.
- Anyimadu, Amos (2005) "Mobile Telephony in Ghana" retrieved Nov. 18, 2009 from //www. mobile telephony in Ghana.
- Cook, Mark and Corri Farquharson (1998). *Business Economics* pp.365, Prentice Hall, UK.
- Dogbevi, Emmanuel K. (2008) "Ghana's growing mobile phone industry – any health implications?" retrieved Nov 10, 2009 from //www. Ghana's growing mobile phone industry.
- Ghana Business News (2009) "Ghana Telephony: For 40 Ghanaians with mobile phones, only one has a fixed line" retrieved Feb 02, 2010 from //www.Ghana Telephony: For 40 Ghanaians with mobile.
- Grzybowski, Lukasz (2008) "The Competitiveness of Mobile Telephony across the European Union" *International Journal of the Economics of Business*, Volume 15, No1.
- Hamilton, Jacqueline (2003) "Are main lines and mobile phones substitutes or complements? Evidence from Africa" retrieved Dec 10, 2009 from //www. Are main lines and mobile phones substitutes or complements? Evidence from Africa.
- Haucap, Justus (2003) "The Economics of Mobile Telephone Regulation", *University FAF Economics Working Paper* No.4.
- Harunah A.A. "Is MTN for real?" retrieved July 28, 2009, from //www. Is MTN for real?
- Hoff, Dean (2006) "Case Study: South African cellular wars in Nigeria" *International Journal of Emerging Markets* Vol. 1 No. 1.
- Kapur, Sandeep (2004) "Competition in Mobile Telephony: the UK and the USA Experience, *Competition Forum*, November 19, Birbeck College, University of London.
- Kwakye, Kwaku (2006) "Ghana Telecom: A Case Study in Mismanagement, Incompetence and Malfeasance" retrieved Dec 10, 2009 from //www.Ghana Telecom: A Case study in Management.
- Mansfield Edwin (1982) *Micro-Economics, Theory & Applications*, 4<sup>th</sup> ed. University of Pennsylvania, Norton.
- Moschandreas, Maria (2000). *Business Economics*, pp.46-58. Thomson Learning, UK

NCA (2008) “Our Guiding Principles” retrieved Dec 10, 2009 from //www. Our Guiding Principle.

NCA (2007) *Mobile Phone Subscribers Study*, Ministry of Communications, Accra.

Nyarko, Emily (2007) “Mobile phone companies face sanctions over service shortfalls” retrieved Dec 10, 2009 from // www. Mobile phone companies face sanctions over service shortfalls.

Public Agenda (2008) “How to implement a policy ensuring fair play, promoting competition, protecting consumers and ensuring development of the industry” retrieved Dec 10, 2009 from //www. How to implement a policy ensuring fair play.

Reekie, W. Duncan (1989) *Industrial Economics – A Critical Introduction to Corporate Enterprise in Europe and America*. Edward Elgar Publishers.

Salami, K. A (2008) “How Efficient is Ghana’s Banking Sector?” *International Academy of African Business and Development (IAABD), Peer-Reviewed Proceedings of the 9<sup>th</sup> Annual International Conference*, The University of Florida, USA, May 20- 24 ISBN 0-9765288-3-5.

Think Ghana – Surfing Everything Ghana (2010) “Ghana’s mobile war heats up retrieved Feb. 02, 2010 from //www.Ghana mobile war heats up/Business/news in Ghana.