

## **Policy Brief**

**“Impact of Cellular Phones on Technical and Allocative Efficiencies of Commercial Taxi and Fishing Boat Firms in Ghana” By Prof. Vijay K. Bhasin, Mr. Simon K. Harvey, and Ms. Eme Umoeka Fiawoyife**

### **Background**

Mobile phones have economic importance for many users in developing countries, as they are enablers of business, in particular for micro-entrepreneurs. Artisans advertise themselves by giving a mobile phone number, taxi drivers are contacted by phone, and retailers do pre-shopping over the phone for supplies. A large majority of small businesses use mobile phones, many of them had no form of telephone access before the acquisition of a mobile phone. Banks are offering cash transfer services through mobile phones in order to avoid queues. The use of phones has resulted in increased turnover and greater efficiency in business.

The entry into the provision of cellular phone services in Ghana is through licensing. The industry is characterised as oligopoly with only five major players MTN, Ghana Telecom, Tigo, Kasapa and Zain. They provide various services to their customers such as telecommunication, SMS, Mobile Internet, and roaming telephone services. The industry is regulated by the National Communications Authority (NCA). By the end of December 2008, there were five (5) cellular network operators. SCANCOM (Ghana) Limited (SPACEFON/AREEBA/MTN) is the leading mobile phone provider with a national outlook and about 6.428 million subscribers as against 2.888 million subscribers of MILLICOM (Ghana) Limited (MOBITEL/TIGO), which has about 60% national coverage. GHANA TELECOM (ONE TOUCH/VODAFONE) also has a national outlook, but experiences customer satisfaction difficulties at the moment. By September 2008, GHANA TELECOM had 1.671 million subscribers. By December 2007, KASAPA Limited (formerly CELLTTEL) had 0.289 million subscribers. By December 2008, Zain had 0.270 million subscribers. The country had 10.24 million subscribers in total or a 43.81 penetration rate as by December 2008. All cellular phone operators are undertaking systems expansion to improve their client base and service delivery.

The present study concentrates on the fishing industry which is a sub-sector of the Agricultural Sector and transport industry which is a sub-sector of the services sector. These two sub-sectors are selected because there is scope for the improvement so far as their contribution to GDP as well as employment and productivity are concerned. In the fishing industry, the study concentrates on the fishing-boat firms; whereas in the transport industry, the study concentrates on the commercial taxi firms.

The commercial taxi firms can use the cellular phones to direct the drivers to pick up passengers from different locations, know the prices of spare-parts and taxis, contact the fitters for the repair of taxis, other taxi owners and police, and for the sale and purchase of taxis. Moreover, drivers can communicate with the owners of taxis in case of breakdown, one driver can also communicate with other drivers and taxi drivers can communicate with passengers.

The fishing-boat firms can use the cellular phones to sell their fish, know the location where to sell their fish catch, know the price of fish at various locations, communicate with boats when they are on the high sea and direct them where to go and catch fish, divert the sale of fish to location where they can fetch higher price, and to sell fish to other boats at high sea. The fishing boats can also communicate with each other on the high sea and move to a location where they can get better fish catch.

### **Research Problem**

It is important for the policy makers to know the productivity of a factor of production, know the levels of technical and allocative efficiencies, and their significant determinants so that the policy makers can know on which factor or determinant to concentrate. The policy makers may also be interested in knowing the various transmission channels through which the productivity of the firms can be improved or the transaction costs can be reduced by the use of cellular phones. The problems faced by different firms depend on the type of firm as well as the location of the firm. Sometime, the stability of the government in power depends on the identification and solution of these problems. The policy makers should also know the views of the key players in some of these firms so as to implement their suggestions.

### **Methodology**

The study has used two questionnaires to collect primary data from the users of cellular phones, especially fishing-boat and commercial taxi firms located in the Central Region of Ghana. Commercial taxi firms are selected from Cape Coast, Elmina, Moree, Komenda, Mankesim and Fosu; whereas we concentrate on fishing boat firms that are located in Cape Coast, Elmina and Moree.

The study has estimated the Cobb–Douglas stochastic frontier production function for commercial taxi firms and the Translog frontier production function for fishing boat firms. The study has also estimated the Cobb–Douglas stochastic frontier cost functions for commercial taxi and fishing boat firms. The maximum likelihood estimates for the parameters of the stochastic frontier models (production as well as cost) and the predicted technical and allocative efficiencies were obtained by using the computer programme, FRONTIER 4.1. The determinants of technical and allocative efficiencies that are considered are age of the owner, education of the owner, member or non-member of the association and ICT investment in cellular phones.

The study has also used the qualitative analysis to identify the transmission mechanisms through which the productivity and transaction costs of these firms can be affected by the use of mobile phones. In addition, the major constraints and the possible solutions are also identified.

### **Findings**

Descriptive analysis indicates that less educated and older people are employed in the fishing industry in comparison to the transport industry. Moreover, fishing-boat firms generally invest less amount of money in cellular phones and do not want to be members of their associations in comparison to the commercial taxi firms.

The estimates of the stochastic frontier production functions show that the ICT investment in cellular phones by the commercial taxi and fishing-boat firms do not have any affect on their productivity. This could be because some of the complementary factors are not in place. On the other hand, the estimates of stochastic frontier cost functions show that the ICT investment in cellular phones by the commercial taxi and fishing-boat firms do have some affect on their total cost-wage ratio which implies that the ICT investment is cost effective in transport and fishing industries.

The qualitative analysis shows that the productivity of commercial taxi firms could be raised by using the mobile phones to locate the drivers, drivers communicating with each other as well as with the passengers, and to contact the other taxi-owners. The transaction costs of commercial taxi firms could be reduced through the use of cellular phones whenever drivers communicate with the owners in case of breakdown, by knowing the prices of taxis and spare parts, to contact the fitters, and for the sale and purchase of taxis. The productivity of fishing-boat firms could be raised by using the mobile phones to sell fish at seashore, by communicating with other boats on high sea, fishing boats communicating with each other on the high sea, and by directing them where to go and catch fish. The transaction costs of fishing-boat firms could be reduced through the use of cellular phones to know the price of fish.

The study shows that there is plenty of scope to raise the technical efficiency and to reduce the allocative efficiency of commercial taxi and fishing boat firms. The study also establishes that fishing industry is less efficient than the transport industry.

### **Policy Implications**

The government of Ghana should concentrate more on the fishing industry in comparison to the transport industry. The technical and allocative efficiencies of commercial taxi firms can be changed by encouraging younger people to start the commercial taxi business. On the other hand, the technical efficiency of the fishing-boat firms could be increased by encouraging educated people to start the fishing business. Poor mobile network system was identified as one of the constraints faced by these firms. NCA should ensure that the providers of mobile phone services improve their network system.

The suggestions made by the taxi-owners are that government should subsidize the price of fuel, make credit available, and advise the police not to threaten taxi drivers; lorry fares should be announced before fuel price increase is announced, leaders of the fitters should advise their members to be truthful, prices of spares parts should be reduced and some of the levies should be scrapped off.

The suggestions made by the fishing-boat firms are that government should subsidize the prices of inputs, improve the storage facilities along the landing ports, and make credit available and buy our product for processing; use of light attraction, dynamite and pair trawlers must be banned, and improvement in the mobile network system at the high sea.