

“Can You Hear Me Now?” How Cell Phones are Transforming Markets in Sub-Saharan Africa

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The introduction of cell phone towers in Niger has reduced differences in grain prices across markets by 20 percent and the intra-annual variation of grain prices by 12 percent.

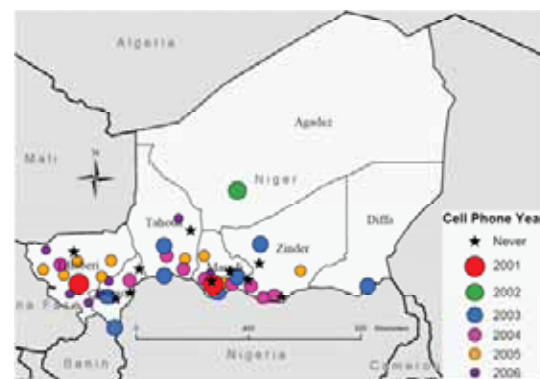
Cell phones are quickly transforming markets in low-income countries. The effect is particularly dramatic in rural areas of sub-Saharan Africa, where cell phones often represent the first development in telecommunications infrastructure. The twelve million residents of Niger, a landlocked country in West Africa, had 20,000 landlines—an estimated 2 landlines per 1,000 people—when mobile phones were first introduced in 2001. Now Niger has almost 400,000 cell phone subscribers. Although the country still has the lowest rate of cell phone adoption in sub-Saharan Africa, cell phone coverage has had important implications for grain markets and hence welfare in the country.

With an estimated 85 percent of its population living on less than two dollars a day, Niger is one of the poorest countries in the world. The majority of Nigeriens are rural subsistence farmers, who depend upon rainfed agriculture as their main source of income. Grains (primarily millet) are dietary staples, accounting for over 75 percent of rural households’ caloric consumption. These commodities are transported from farmers to consumers through an extensive system of markets that run the length of the country, which is roughly three times the size of California.

As grain markets occur only once per week, traders have historically traveled long distances to markets to obtain market information. This not only requires the cost of travel, but also the opportunity costs of traders’ time. Between 2001 and 2006, however, cell phone service was phased in throughout the

country (Figure 1), providing an alternative and cheaper search technology to grain traders, farmers, and consumers. In theory, then, cell phones should have reduced traders’ search costs, thereby allowing them to search over a larger number of markets and to search more quickly.

Figure 1. Rollout of cell phone towers by market in Niger, 2001–2006



This fact is supported by reports of the grain traders themselves. A grain trader in Magaria, Niger, stated, “[With a cell phone], in record time, I have all sorts of information from markets near and far.” Another grain trader in Zinder, Niger, explained, “[Now] I know the price for two dollars, rather than traveling [to the market], which costs \$20.”

The introduction of cell phone towers in Niger has reduced differences in grain prices across markets by 20 percent and the intra-annual variation of grain prices by 12 percent. Cell phones have had a greater impact on price dispersion for markets that are farther away, and for those that are linked by poor-quality

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Figure 2. Grain intermediary in the market of Dogondoutchi, Niger. Credit: Aker.

roads. This effect has also intensified over time: the reduction in inter-market price dispersion has increased as a higher percentage of markets have cell phone coverage.

Why would cell phones lead to a reduction in price differences across markets? Since cell phones reduced traders' search costs by 50 percent, they were able to change their marketing behavior. By 2006, grain traders operating in cell phone markets searched over a greater number of markets, had more market contacts, and did business in more markets as compared to their counterparts without cell phones. This suggests that traders in cell phone markets were better able to respond to surpluses and shortages, thereby allocating grains more efficiently across markets and dampening the price differences.

Did cell phones only help the traders? Not necessarily. Between 2001 and 2006, cell phones were associated with a 3.5 percent reduction in average consumer grain prices, as well as an increase in traders' profits. Holding all else equal, this would have enabled rural households to purchase an

additional five to ten days' worth of grain per year. In 2005—the year that Niger experienced a severe food crisis—cell phone markets in food crisis regions had relatively lower consumer grain prices. This suggests that the presence of cell phone towers could have averted a worse food crisis. Since a majority of rural households in Niger are net consumers, lower consumer prices suggest that people were better off.

While rigorous empirical studies on the impacts of cell phones remain limited, there is increasing evidence of their effects on markets and general well-being at the micro- and macro-level in low-income countries. Robert Jensen found that the introduction of cell phones in 1997 increased fishermen's profits by 8 percent and decreased consumer prices by 4 percent in Kerala, India.¹

So how can we use information technology to promote economic development in Sub-Saharan Africa? Evidence in Niger points to the following policy implications:

It's the "I"—not just the "IT." Access to information is crucial for ensuring that farmers, traders and consumers can engage in optimal arbitrage—in other words, buying and selling goods when and where it's needed most. This, in turn, improves market performance, which increases welfare.

But . . . cell phones are particularly well-suited to the way in which many households search for information, especially in sub-Saharan African. Cell phones allow consumers, traders and farmers to search for market information when, where and how they want. While traditional agricultural market information systems (MIS) have provided low-cost information to farmers, traders, and consumers via radios or message boards, market agents have not been active participants in the information-gathering process. Cell phones are a particularly

effective means of providing such information to market participants, and are being quickly adopted in low-income countries. Consequently, the role of information technology should be central to any debate on information systems in low-income countries, including those for markets, for early warning of famine, and for public health.

The two I's: information and infrastructure. While information is necessary for the efficient markets, it is not sufficient: markets require infrastructure and financial services to work, most of which are limited in sub-Saharan Africa. Donors and international organizations that seek to improve market access in Africa therefore should not focus on information alone: power and roads are needed to boost growth.²

Don't go it alone. Public-private partnerships in IT can provide more “bang for our buck” in achieving development outcomes. “Making Life Better.” “A Wonderful World.” “Connecting People.” These are a few of the slogans used by cell phone service providers and companies throughout the world. While development outcomes are not an explicit goal

of IT companies, information technology can serve as an effective poverty reduction tool for governmental and non-governmental organizations.

By combining the public sector's knowledge of and expertise in development-oriented domains (agriculture, health and education) with private companies' technical expertise and innovation, public-private partnerships can increase the potential impact, sustainability, and efficiency of development interventions.

The key is ensuring that such partnerships are used to develop and disseminate relevant and effective information technology solutions to solve specific development challenges. Some of these partnerships are already in place, but donors, host country governments, and non-governmental organizations should seek out increased opportunities for collaboration with the IT sector in the areas of emergency response, education, health and market information services.

1. Jensen 2007.
2. Ramachandran 2008.

Further Reading

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