





A small coffee grower in Costa Rica keeps in touch with international market prices, and ultimately arranges sale and pick-up of his crop, via his mobile phone. A family in the Philippines, dependent on money from a member working as a nurse in the United States, can pick it up at a local McDonald's, transferred quickly and inexpensively by a mobile phone remittance system. It may seem obvious, but those in the BOP cannot join the global economy, and benefit from it, until they are connected to it.

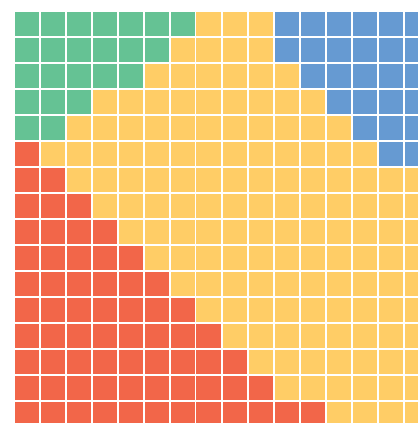
The household survey data reported here show significant demand for such connections and a willingness to pay—because the value proposition, for someone without connectivity, is compelling. A recent study among low-income families in Tanzania showed that access to livelihoods was a primary reason for owning a mobile phone (Vodafone 2005).

Not surprisingly, mobile phone companies in emerging markets are growing rapidly, adding hundreds of millions of customers a year (World Bank 2006b). With more than 1.5 billion mobile phone customers in developing regions—the size of the mid-market and high-income population segments—most new customers in these regions now come from the BOP.

Advanced services are starting to appear. Wizzit, a start-up in South Africa, and Globe Telecom and Smart Communications in the Philippines together are providing banking services over mobile phones to more than a million previously unbanked customers in those two countries alone (Ivatury and Pickens 2006).

A broader range of businesses is developing to provide services to the BOP. Some 1.6 million small sari-sari shops in the Philippines help customers with electronic uploads of voice or text-messaging units for their mobile phones, generating almost \$1 billion in revenue. At the other end of the size spectrum, both Microsoft and Intel now have emerging-market divisions focused on developing new products for the BOP.

**BOP spending on ICT**  
\$51.4 billion



	\$ billions (PPP)
Africa	4.4
Asia	28.3
Eastern Europe	5.3
Latin America	13.4

Each square represents approximately \$200 million

## CASE STUDY 3.1 **CELTEL:** **FROM START-UP TO TELECOM GIANT**

Combining a focus on underserved markets in Africa with a commitment to clean, transparent business practices, Celtel has become a leader in the highly competitive African telecom market. The company was founded in 1998 by a British entrepreneur of Sudanese descent, Dr. Mo Ibrahim. Later that year Celtel launched service in Zambia, Sierra Leone, and the Republic of Congo. The company gradually added 10 more countries to its portfolio—Malawi, Gabon, the Democratic Republic of Congo, Chad, Burkina Faso, Niger, Uganda, Tanzania, Sudan, and Kenya.

Celtel operates in some of the most difficult sociopolitical environments in the world—amid civil war and political unrest—yet the company is committed to clean, corruption-free business. Founder Ibrahim has been outspoken in his promise that Celtel will pay “not a single dollar” in bribes.

Overcoming adverse business and political environments, Celtel quickly expanded its customer base to 6 million thanks to its focus on the needs of low-income consumers. Celtel’s offerings are prepaid and sold in small increments. Subsidiaries in Tanzania and Zambia offer mobile banking services over the network. Some 98% of the firm’s staff are African, many of them holding company stock.

Many of those stockholding employees cashed in when Celtel was acquired by Kuwait-based MTC in mid-2005 for US\$3.4 billion. Celtel, now a wholly owned subsidiary of MTC, serves 15 countries in Africa and holds licenses covering more than 30% of the continent—the largest footprint of any company in Africa. In just seven years Celtel went from start-up to telecom giant—and did so by pursuing a BOP-focused, ethically driven business strategy in some of the world’s most neglected economies.<sup>5</sup>

Both in its use of prepaid services offered in small units and in its willingness to do business in challenging environments, Celtel exemplifies a strategy of **enabling access**.

### **How large is the market?**

The measured BOP market for ICT—information and communication technologies and the services they provide—is \$30.5 billion for Africa (11 countries), Asia (9), Eastern Europe (6), and Latin America and the Caribbean (9). This represents annual household ICT spending in the 35 low- and middle-income countries for which standardized data exist, covering 2.1 billion of the world’s BOP population.

The total BOP household ICT market in these four regions, including 3.96 billion people in all surveyed countries, is estimated to be \$51.4 billion (see box 1.5 in chapter 1 for the estimation method).<sup>1</sup> But the ICT sector has been growing explosively in developing regions in the interval since countries were surveyed, with Internet services and especially mobile phone companies adding customers at rates that may well have doubled BOP sector spending since that time.<sup>2</sup> Moreover, rapid market growth is expected to continue for some time: in both Africa and India less than 15% of the population have mobile phones.<sup>3</sup>

Asia has the largest measured regional BOP market for ICT, \$14.3 billion, reflecting the region’s significant BOP population of 1.49 billion. Its estimated total BOP market for ICT

(including the Middle East) is \$28.3 billion, including the spending of 2.9 billion people. Not far behind is Latin America’s measured BOP market, \$11.2 billion, accounting for the ICT spending of 276 million people. The region’s estimated total BOP market is \$13.4 billion (360 million people).

In Eastern Europe the measured BOP market for ICT is \$3.0 billion (148 million people); the estimated total market is \$5.3 billion (254

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million people). In Africa the measured BOP market is \$2.0 billion (258 million people), and the estimated total BOP market \$4.4 billion (486 million people). Though smallest, the African ICT market is the most rapidly growing one—and it has already generated very profitable companies and significant wealth (case study 3.1).

The BOP share of the total household ICT market in measured countries varies across regions. In Asia the BOP share is about half of the total market, 51%; in other regions it is smaller though still substantial: 36% in Eastern Europe, 28% in Africa, 26% in Latin America. Africa shows the greatest disparity between the BOP share of the population (95%) and the BOP share of ICT spending (28%).

At the national level there are wide disparities in the BOP share of ICT spending. These disparities stem in part from regulatory differences affecting the pace at which mobile phone networks expand (case study 3.2). They also reflect national differences in urban-rural demographics, since mobile networks start in urban areas and only then spread to rural areas.

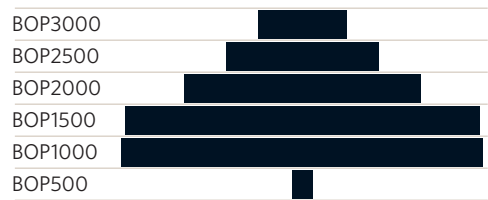
In Asia the extremes are represented by Pakistan and Bangladesh, where the BOP accounts for more than 89% of the ICT market, and Thailand, where the BOP population, though substantial, accounts for only 29% of the market. In Africa the extremes are Nigeria (98%) and Burundi (12%). In Eastern Europe the extremes are represented by Belarus and Kazakhstan (74%) and FYR Macedonia (21%). In Latin America and the Caribbean, only in Jamaica does the BOP account for more than half of total ICT household spending (71%); the other extreme is Colombia, where the BOP accounts for only 12% of ICT spending.

### How is the market segmented?

In Asia and Africa most BOP markets for ICT are either top heavy, like those in Sri Lanka and Uganda, or centered on the middle of the income spectrum (in the BOP1500, BOP2000, and BOP2500 segments), like those in Pakistan or Côte d'Ivoire. Indonesia, with \$2.1 billion in annual BOP spending for ICT, offers another example of a market centered on the middle

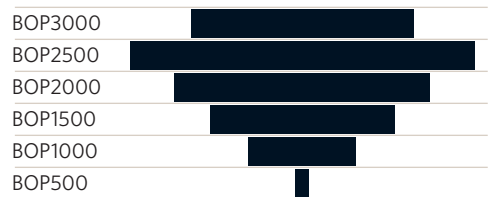
### Pakistan

TOTAL ICT SPENDING BY INCOME SEGMENT



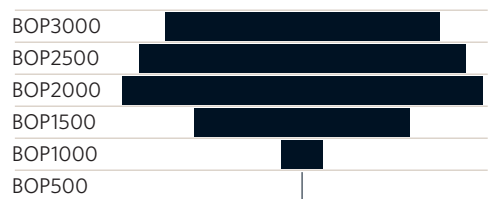
### Uganda

TOTAL ICT SPENDING BY INCOME SEGMENT



### Belarus

TOTAL ICT SPENDING BY INCOME SEGMENT

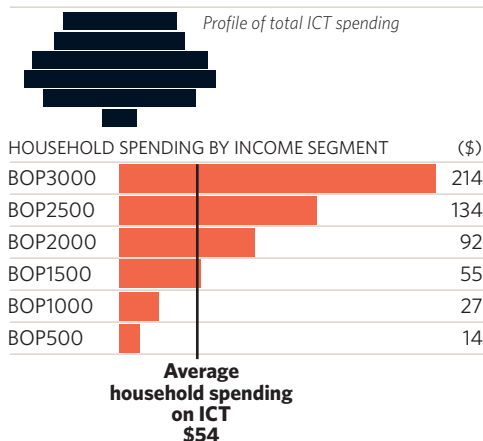


## CASE STUDY 3.2 REGULATORY REFORM: OPEN MARKETS ARE BIGGER MARKETS

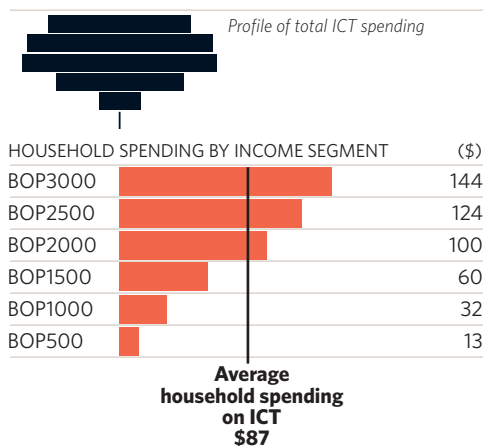
A key driver of the rapid growth of ICT services in many developing countries has been the opening of markets to competition. But only about half of low- and middle-income countries have undertaken such reforms, and the difference is apparent: the Democratic Republic of Congo, with six competing mobile phone companies, has 13 times as many mobile customers per 1,000 people as does Ethiopia, with similar income per capita but only a single mobile company (World Bank 2006b). Where barriers to competition still exist, prices for ICT services are higher—twice as high on average—and market penetration is slower.

While the reform process is well advanced for mobile telephony, barriers are still the rule for newer and potentially much less expensive ICT services. In many countries Voice-over-Internet telephony remains illegal. Relatively few countries have assigned frequencies for newer, fixed wireless services, despite their potential to expand markets and make ICT services affordable and accessible to a larger share of the BOP, especially in rural areas. And only a few countries have coordinated banking and telecom regulations to pave the way for mobile phone banking, which could bring affordable financial services to hundreds of millions of people who are now unbanked. As reforms advance, so will markets and private sector investment.

### Cambodia



### Kazakhstan



(case study 3.3). There are as yet few bottom-heavy BOP markets, reflecting the still modest penetration of ICT services into BOP populations and into rural areas.

Eastern Europe and Latin America also have top-heavy BOP markets, exemplified by Belarus and Peru. Moreover, the wealthier mid-market segment accounts for most of the total ICT market in half the measured countries of Eastern Europe and all those of Latin America. In contrast, the BOP dominates Asian and African markets; in only five countries—Thailand, South Africa, Rwanda, Malawi, and Burundi—does spending by the mid-market segment exceed that by the BOP.

#### What do households spend?

Business models play a big part in ICT spending. Prepaid mobile telephony in small units and Internet access by the quarter hour in cybercafes, for example, have helped to create affordability. That may account for the remarkable levels of ICT spending by BOP households documented in the surveys. Except in the very lowest BOP income segment, average ICT spending per household generally exceeds spending on water—and in the upper BOP income segments sometimes exceeds spending on

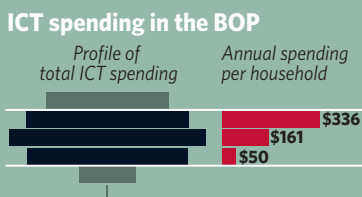
health. Continuing rapid growth in the ICT sector in developing countries suggests ample untapped demand.<sup>4</sup> Recorded levels of household ICT spending should thus be regarded as establishing a lower bound for the willingness to pay.

Access to services also plays a big part in household spending, especially in the ICT sector—where most rural communities are still underserved—as do demographic factors. As a result, average ICT spending per BOP household varies widely across countries, but can also be similar despite quite different market characteristics. For example, Côte d’Ivoire and Sierra Leone report similar spending by BOP households—averaging \$57.60 and \$46.40 a year—yet Côte d’Ivoire’s BOP market is decidedly bottom heavy while Sierra Leone’s is more top heavy, trending toward the top two income segments (BOP2500 and BOP3000). Reported spending can also reflect differences in the

### CASE STUDY 3.3 INDONESIA: AN ICT MARKET CENTERED ON THE MIDDLE OF THE BOP

In Indonesia ICT spending by BOP households is concentrated in the BOP1500, BOP2000, and BOP2500 income segments. These three segments account for 59% of the total ICT market and 28% of all households in Indonesia; with 15 million households and \$1.6 billion in annual ICT spending, this is a substantial market. Annual ICT spending per household in these income segments averages \$50, \$161, and \$336.

Moving up-market dramatically increases ICT spending per household—but the overall market still is decidedly concentrated in the middle BOP segments. Average annual ICT spending per household in the relatively small but much wealthier mid-market population segment (\$1,238) is about eight times that in the BOP (\$149).



### CASE STUDY 3.4 **SMART TELECOMS: TAILORING SERVICES, TRANSFORMING MARKETS**

Most of the ICT spending recorded by household surveys is for phone service. Another spending category, generally smaller, is for ICT equipment (television sets, music players, computers, phones, cameras). A still smaller one is for repair of such equipment. Other information shows that most BOP users access the Internet from cybercafes or other shared-access points, not from home; the same is true for a large share of those using phone service.

These survey categories fail to do justice to the richness of the ICT services and business strategies propelling BOP markets. In the Philippines, for example, Smart Communications has transformed the cell phone market by allowing electronic sales of airtime through short message service (SMS) and by reducing the unit size of such sales to as little as US\$0.03. This innovation has allowed access to communication services for millions of low-income Filipinos; 98% of Smart’s subscribers are low-income, prepaid customers. Its SMS-based transaction system allows customers to transfer prepaid units to one another, providing an electronic “currency” that facilitates small transactions. And it allows small merchants to resell minutes, with a commission on every sale—creating a business opportunity for 800,000 microentrepreneurs.

Smart also started the world’s first remittance system by text message. Expatriate Filipinos can give cash payments to international agents, who then transfer the cash to the designated recipients back in the Philippines. The recipients, alerted by an SMS message on their phone, can immediately withdraw the cash from the local McDonald’s branch. Moreover, the service is cheaper than the informal, underground network often used to transport cash to the Philippines from abroad (Smith 2004b).

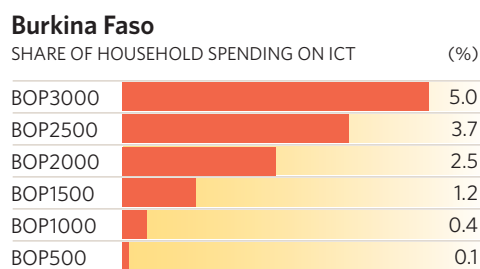
Smart Communications exemplifies two BOP business strategies: focusing on the BOP through its innovation of new services and localizing value creation through its extensive network of agents.

questions asked and expenditures captured in national surveys.

A more meaningful characterization may be the median of annual BOP per household spending on health for each region. These figures are as follows: for Africa, \$33.89 (Cameroon); for Asia, \$53.62 (Cambodia); for Eastern Europe, \$55.83 (Belarus) and \$87.00 (Kazakhstan); and for Latin America, \$107.40 (Peru). India has the largest measured BOP market for ICT in Asia, with \$7.8 billion in aggregate household spending (53% of the national ICT market); average ICT spending per BOP household is \$42 a year. (No expenditure data are available for China.) In other regions the BOP market leaders are Brazil (\$5.5 billion, 27% of the total market), Russia (\$1.4 billion, 35% of the total market), and South Africa (\$745 million, 14% of the total market). Annual BOP per household spending averages \$173 in Brazil, \$53 in Russia, and \$109 in South Africa.

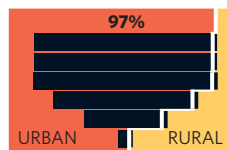
In most countries measured, ICT spending per household increases roughly in proportion to income through the BOP, especially above the lowest income segment. In many countries, however, ICT spending increases disproportionately in the highest BOP income segments (BOP2500 and BOP3000), indicating latent demand for ICT services in the BOP. Among the median countries by region discussed above, the ratio of average household ICT spending in the BOP3000 income segment to that in the BOP1000 segment is 27:1 in Cameroon, 8:1 in Cambodia, 4:1 in Belarus and Kazakhstan, and 32:1 in Peru.

As incomes rise still higher, per household ICT spending increases as well, but to an extent that varies by country—only modestly in Latin American and Eastern European countries on average, more so in most African and Asian countries. A useful measure is the ratio of average annual ICT spending by mid-market households to that by BOP households. In the above countries, mid-market households outspend BOP households by about 12:1 in Cameroon and 12:1 in Cambodia; 2:1 in Belarus and



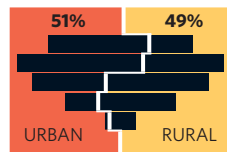


### Brazil



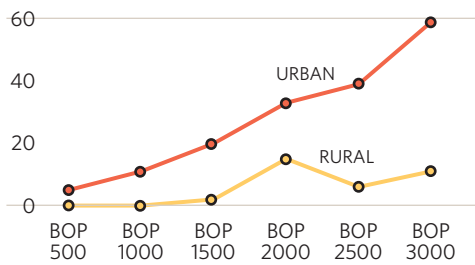
Total BOP ICT spending by income segment, urban and rural

### India



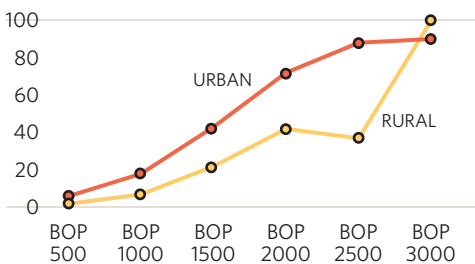
### Bolivia

PERCENT OF HOUSEHOLDS WITH A TELEPHONE



### Pakistan

PERCENT OF HOUSEHOLDS WITH A TELEPHONE



Kazakhstan; and 8:1 in Peru. These ratios are considerably higher than those in other infrastructure sectors, such as energy and water, again suggesting quite a bit of latent demand for ICT services (case study 3.4).

### Where is the market?

In the still largely urban-centered ICT sector, there are vast differences in size between urban and rural markets, including their BOP segments. In all measured countries except Cambodia and Sri Lanka, urban areas dominate the overall ICT market. Urban areas also dominate the BOP market in all Eastern European and Latin American countries, in all African countries except Uganda, and in four of nine Asian countries, including India, Indonesia, and Pakistan.

In Brazil, for example, the BOP market for ICT is 97% urban, and average annual spending by urban BOP households (\$203) is seven times that by rural BOP households. In Russia the urban share of the BOP market is 71%, and the ratio of urban to rural household ICT spending is 2:1. In Asia, India's BOP market for ICT is 51% urban, with urban BOP households outspending rural ones 3:1; Pakistan and Indonesia have even larger urban shares of the BOP market, 69% and 93%. In Africa, South Africa's BOP market is 68% urban, with urban households spending twice as much on average as rural households; Nigeria has a 77% urban share.

Despite generally lower levels of ICT spending in rural areas, the sheer size of the rural population in some countries means a significant rural market. Thailand's rural BOP market for ICT, for example, is \$1.5 billion, with household spending averaging \$160 a year. India's is \$3.8 billion. Mexico's is \$767 million, with average annual per household spending of \$154.

### Is there evidence of a BOP penalty?

Rural ICT market shares may have increased somewhat in recent years, as mobile networks have expanded out of urban centers. But the overall urban-rural pattern in BOP spending is consistent with widespread lack of access to ICT services in rural areas. The differences cannot be entirely due to higher urban incomes. In Bolivia, for example, urban BOP households spend 365% more on ICT than their rural counterparts, yet have only 94% more income (based on measured total expenditure).

Clearly, lack of access to ICT services in rural areas can be a significant BOP penalty, one that keeps rural households disconnected from markets and broader information sources and thus reinforces rural isolation and poverty.

Data on phone ownership support lack of access as a primary cause of the disparity: in Bolivia only 2% of rural BOP households report owning a fixed or cellular phone, compared with 13% of their wealthier mid-market rural neighbors and 25% of urban BOP households. This pattern is widespread. In Russia 27% of rural BOP households own a phone, compared with 48% of mid-market rural households and 53% of urban BOP households. In Pakistan 6% of BOP households in rural areas own a phone, compared with 26% of those in urban areas.

Clearly, lack of access to ICT services in rural areas can be a significant BOP penalty, one that keeps rural households disconnected from markets and broader information sources and thus reinforces rural isolation and poverty. The penalty would be more severe without the widespread—though far from universal—public or shared-access ICT services.

### How shared access helps reduce the BOP penalty

While few rural BOP households in Bolivia own a phone, survey data show that such households nevertheless spend an average of \$35 a year on ICT, more than \$27 of it for “telephone and telefax services.” Simply put, these rural households cannot afford to purchase a phone, but they will gladly pay to use one—whether a public pay phone, a neighbor’s cell phone, or a shared-use phone owned by an entrepreneur.

Paraguay provides an even starker example. A survey there shows that among rural BOP households only 0.25% report owning a phone. Yet the same survey reports that annual per household ICT spending in this group averages

### CASE STUDY 3.5 COMMUNITY PHONES: ENTREPRENEURS PROVIDE SHARED ACCESS

Vodacom Community Services, a program of South Africa’s largest cellular phone company, shows how business and government can work together to achieve social and economic goals. Developed by Vodacom to meet a 1994 government mandate to provide services in BOP communities, this innovative program relies on phone shops owned and operated by entrepreneurs. The program has both provided affordable communication services to millions of South Africans and empowered thousands of previously disadvantaged entrepreneurs.

At a cost of about R 26,000 (US\$3,450), prospective owners can start a Community Services franchise to operate cellular lines from inside a converted shipping container. The phone shops are independent businesses, but they offer standard products and services. At any Community Services phone shop in the country, customers can make a phone call for a set rate of R 85 (US\$0.11) a minute, less than a third of the commercial rate for prepaid cellular calls.

In a good location a phone shop with five lines typically handles more than 100 hours of calling a month per line, generating total monthly revenues of R 27,000 (US\$3,550); of this, R 9,000 (US\$1,190) goes to the entrepreneur. The phone shops take advantage of Vodacom’s extensive cellular network, which provides coverage to 93% of South Africa’s 44 million citizens. Today the shops service more than 23,000 cellular lines at more than 4,400 locations throughout South Africa (Reck and Wood 2003).

The community phone shops have succeeded by harnessing local entrepreneurs, exemplifying a strategy of **localizing value creation**.



### CASE STUDY 3.6 **INVESTING IN THE BOP: BUSINESS STRATEGIES FOR THE NEXT BILLION**

Reports from a 2006 global conference of the International Telecommunication Union suggest that telecom and information technology executives are now focusing on the BOP population in emerging markets as the source of their next billion customers. They are using a range of strategies to target the BOP.

Qualcomm, for example, is helping partners in India launch mobile phones, based on the company's technology, that cost less than US\$30. While the phones may not earn much money for Qualcomm, they represent an investment in the future, according to Paul Jacobs, the company's chief executive officer. "We don't think we're going to make a lot of money on the first phone that somebody buys," he says. "But eventually [that customer] will buy more and more."

Moreover, Jacobs argues, a lot of innovation comes from focusing on developing inexpensive products for emerging markets. "It used to be that you would invest in the high-end services and they would trickle down," he says. "Now we invest equally in the low end and high end and things trickle to the middle."<sup>6</sup>

Motorola too believes that focusing on emerging markets results in innovation. The company sells a US\$30 handset designed in India with rural users in mind. The phone can give instructions to a user by audio rather than in text form—in case the user is not literate. It also has a reflective display that people can easily see when outdoors and a battery with a standby time of two weeks (GSM Association 2005).

Such companies as Intel, Motorola, and Samsung Electronics make a case for new fixed wireless technologies, WiMax and WiFi, to connect the next billion users, arguing that wireless is far cheaper than copper, especially given the run-up in copper prices in recent years. Intel has been supporting trials in Southeast Asia. Samsung is providing equipment for trials in Latin America and plans to market the equipment in Southeast Asia and Africa.

These examples exemplify a strategy of **focusing on the BOP**.

\$128 a year, with \$117 of it going to telephone services.

This pattern—in which very few rural households own a phone yet most spend significant amounts on phone service—also holds in other countries. In Uganda measured annual spending for phone service averages \$29 across all rural BOP households, yet just 0.10% report owning a phone. In Pakistan, where just 6% of rural BOP households own a phone, annual spending on phone services by rural BOP households averages \$24. Mexico's ownership rate is higher than those in African and Asian countries, at 17%, but so is its average annual spending on phone services by rural BOP households, at \$137.

In some countries public pay phones provide shared access; in others, such as India and South Africa, entrepreneur-run phone shops provide the access (case study 3.5). Cybercafes and kiosks similarly provide shared access to computers and the Internet.

#### **New technology, new market potential**

Will phones become the Internet platform for BOP households and rural communities? Several factors suggest that they will, including the business strategies adopted by some major mobile phone manufacturers and information technology companies (case study 3.6).

Mobile phones already have an enormous lead over computers in developing countries. Moreover, phones are relatively easy to master, generally require no sophisticated technical support, and, as voice-based devices, pose no literacy

barrier. Phones are less expensive than computers—basic GSM models designed for developing countries are approaching US\$30—and service is often offered through prepaid business models that are more affordable for BOP consumers.

The combination of powerful phones, inexpensive networks, and voice-accessible applications may open up the Internet to large numbers of new users.

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Increasingly, mobile phones also offer Internet services such as e-mail and Web browsing and are becoming a platform for banking and other financial services. Driven by intense competition, mobile phone manufacturers are rapidly adding new capabilities—digital photography, voice recognition, and biometric identification, to name a few. As a result, industry observers forecast, within five years the typical mobile phone will have the processing power of today's desktop computers.

Equally important is the potential for low-cost fixed wireless networks in rural areas, bringing Internet access—and Voice-over-Internet telephony—to phones and other devices in areas too sparsely populated to support conventional cellular networks. Adding a WiFi chip to a mobile phone to allow access to such rural networks will cost only a few dollars.

The combination of powerful phones, inexpensive networks, and voice-accessible Internet applications—for obtaining market prices, health information, or government services—may open up the Internet to large numbers of new users. In any event, it is clear that ongoing innovation in technology will help increase the potential of rural—and largely BOP—ICT markets.

#### Endnotes

1. Reported household expenditures in a given country should be regarded as a minimum estimate of actual expenditures, because surveys may not have collected information on all types of ICT-related spending.
2. For a comprehensive overview, see the World Bank's Information and Communications for Development 2006: Global Trends and Policies (2006b). To illustrate the rapid growth in the sector, the report cites the increase in mobile phone subscribers in Nigeria from 370,000 to 16.8 million between 2001 and 2005, and the sixfold growth in the Philippines to 40 million subscribers between 2000 and 2005. Access to phones tripled in Sub-Saharan Africa and East Asia between 2000 and 2004, nearly doubled in South Asia, and doubled in Latin America and Central Asia. The numbers of Internet users grew even faster, though from a much smaller base.
3. Economist, "Out of Africa," December 9, 2006, 67–68.
4. In late 2005, for example, India was reported to be adding more than 6 million new mobile subscribers a month (Katie Allen, "Motorola's Gloomy Outlook Casts Shadow on Mobile Phone Market," Guardian Unlimited, January 6, 2006, <http://business.guardian.co.uk/story/0,,1983795,00.html> accessed January 18, 2006).
5. Michela Wrong, "Mo Ibrahim: Revolutionising Communications in Africa. His Tool? The Mobile Phone," New Statesman, October 17, 2006, <http://www.newstatesman.com/200510170021>; Mo Ibrahim, presentation to World Bank, April, 2006.
6. Bruce Einhorn, "Telecoms Hungry for Next Billion Callers," BusinessWeek, December 7, 2006, [http://www.businessweek.com/globalbiz/content/dec2006/gb20061207\\_197764.htm](http://www.businessweek.com/globalbiz/content/dec2006/gb20061207_197764.htm).