

Unshackled: How Regulation Can Amplify Mobile Service Benefits in Emerging Markets

SCOTT BEARDSLEY, McKinsey & Company, Inc., Belgium

LUIS ENRIQUEZ, McKinsey & Company, Inc., Belgium

MEHMET GÜVENDI, McKinsey & Company, Inc., Turkey

MIGUEL LUCAS, McKinsey & Company, Inc., Portugal

OLEG TIMCHENKO, McKinsey & Company, Inc., Russia

SERGIO SANDOVAL, McKinsey & Company, Inc., Belgium

ASHISH SHARMA, McKinsey & Company, Inc., Singapore

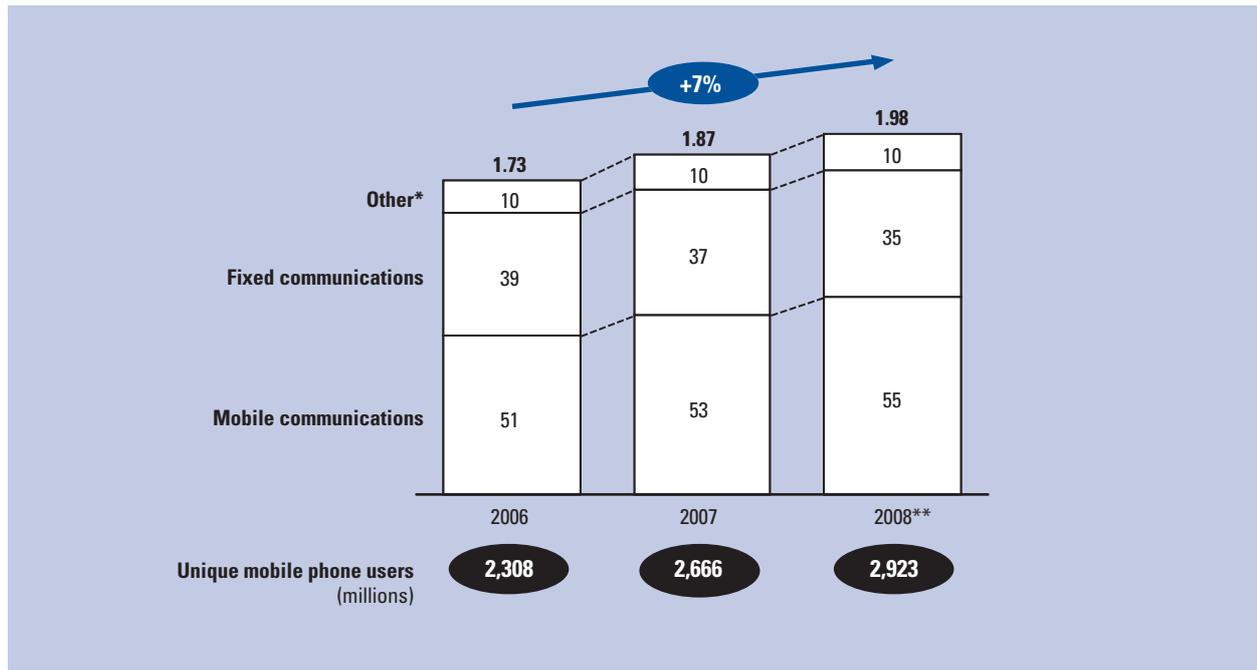
Over the past 20 years, mobile communications have become an indispensable part of life for billions of users worldwide. About 2.9 billion people currently enjoy mobile service, with an additional 700 thousand signing up each day. As usage has swelled, the mobile phone itself has evolved beyond voice communication alone, allowing consumers to read news, listen to music, search for nearby restaurants, take photos, and make payments. Not surprisingly, the mobile segment of the industry has quickly overshadowed fixed-line communications, accounting for 55 percent of the global industry's US\$2 trillion annual revenues in 2008 (Figure 1).

Mobile communications play a central role in emerging markets, acting as a crucial enabler of economic growth and development. Given the inadequate fixed-line phone infrastructure most of these countries endure, mobile service offers millions a unique opportunity to stay in touch easily with their families, friends, and business partners. For example, in Indonesia, only 10 people in 100 have fixed-line phone service, while 52 percent of the population owns a mobile phone. Beyond staying connected, mobile service allows people to access other services they could not use before—such as micro-payments. For instance, Vodafone runs a very successful mobile money transfer operation in Kenya that has attracted over 5 million customers since its launch in March 2007.¹ The company has also partnered with an international payment provider to offer cross-border money transfers in addition to domestic payments.

Emerging markets hold an important position on the mobile industry's agenda as well, because of their strong potential. They contain 75 percent of the world's subscribers today, and—given the difference in growth rates between emerging and mature markets (i.e., 11.8 percent versus 3.3 percent per year, respectively, in 2008)—this number will grow to 79 percent by 2015. These subscriber-heavy markets also hold some of the industry's best players: Ukrainian operator Kyivstar, a part of the Telenor group, generated a 62 percent EBITDA (earnings before interest, taxes, depreciation and amortization) margin in the third quarter of 2008,² and Russian mobile operators have traditionally enjoyed margins that approach 50 percent (the global average for the industry is about 45 percent).³

But succeeding in these markets requires different and innovative approaches from those needed for developed economies. Emerging markets thrive on unique services such as the micro-payment plans mentioned earlier; “torch phones” that feature multiple LED lights for users who live in areas with little or no regular electricity service; multiple phone books for users who

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Figure 1: Mobile telecommunications revenue growth (US dollars, trillions)

Source: Dataquest Insight, June 2008.

*Other includes infrastructure, enterprise networking, and communications.

**Estimates.

share their handsets with family members; or solar device chargers for use in sunny Africa (see Box 1).

The enormous societal and economic benefits mobile service can bring to emerging markets extend well beyond the industry's direct contribution to a country's GDP, although that in itself is not small. To capture the full potential that wireless service offers, governments and industry players must focus on making the widest possible slice of society "mobile." Many markets fail to meet this challenge. Those that do, such as China or the Philippines, typically enjoy mobile penetration rates far greater than those seen in peer countries by focusing on high coverage rates (which coincide with penetration) and low user prices, and they make sure both outcomes are sustainable.

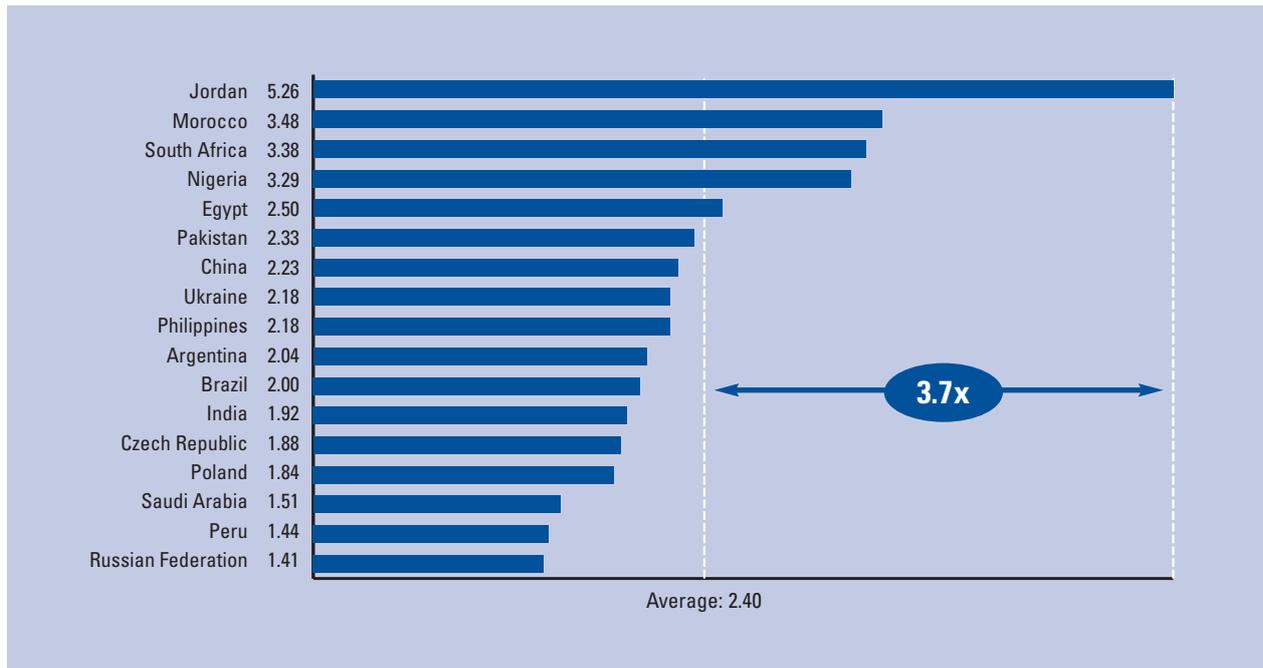
To capture the economic benefits wireless can bring while also ensuring that the poorest members of society can use this service, regulators and operators must work together to lower the cost of ownership, making mobile phones affordable to all. They also need to extend coverage beyond cities to rural areas, where many millions of potential users await. In this chapter, we will attempt to quantify the benefits of mobile services in emerging markets, discuss reasons why some nations fail to achieve these benefits, and suggest several regulatory areas where policymakers and industry players can work together to unlock the value of the mobile industry in emerging markets.

The many benefits of going mobile

The mobile industry often accounts for 2 percent to 3 percent of an emerging market's GDP, with a range that extends from 1.4 percent in Russia to 5.3 percent in Jordan (Figure 2). However, the indirect contribution of the mobile industry to the economy can range several times higher than this observable GDP effect, because it includes GDP contributions from other companies in the wireless sector, such as handset manufacturers and retailers, content providers, and equipment manufacturers, as well as what we call the "end-user surplus." This surplus includes not only direct productivity gains related to the use of mobile communications, but also indirect consumer benefits such as a peace of mind, security, and access to family.

For example, take the case of a taxi driver who shares his cab with another driver in alternating 12-hour shifts. Buying a mobile phone improves his productivity because he now receives six or seven calls per month from regular passengers, which saves him from spending about four hours a week seeking passengers. He uses his mobile phone to contact other taxi drivers if, for example, he needs to ask directions to unfamiliar destinations. This person also uses his phone to stay in touch with his family and friends, and his employer benefits as well: the company now provides an instant lost-and-found service to passengers.

For this taxi driver, the benefits of going wireless take two forms, which together we call the *end-user surplus*. The first involves greater productivity.⁴ McKinsey

Figure 2: Contribution of mobile telecommunications services to GDP, 2008 (percent)

Source: Pyramid Research, 2008d.

Box 1: Successful innovations in mobile telecommunications from emerging markets

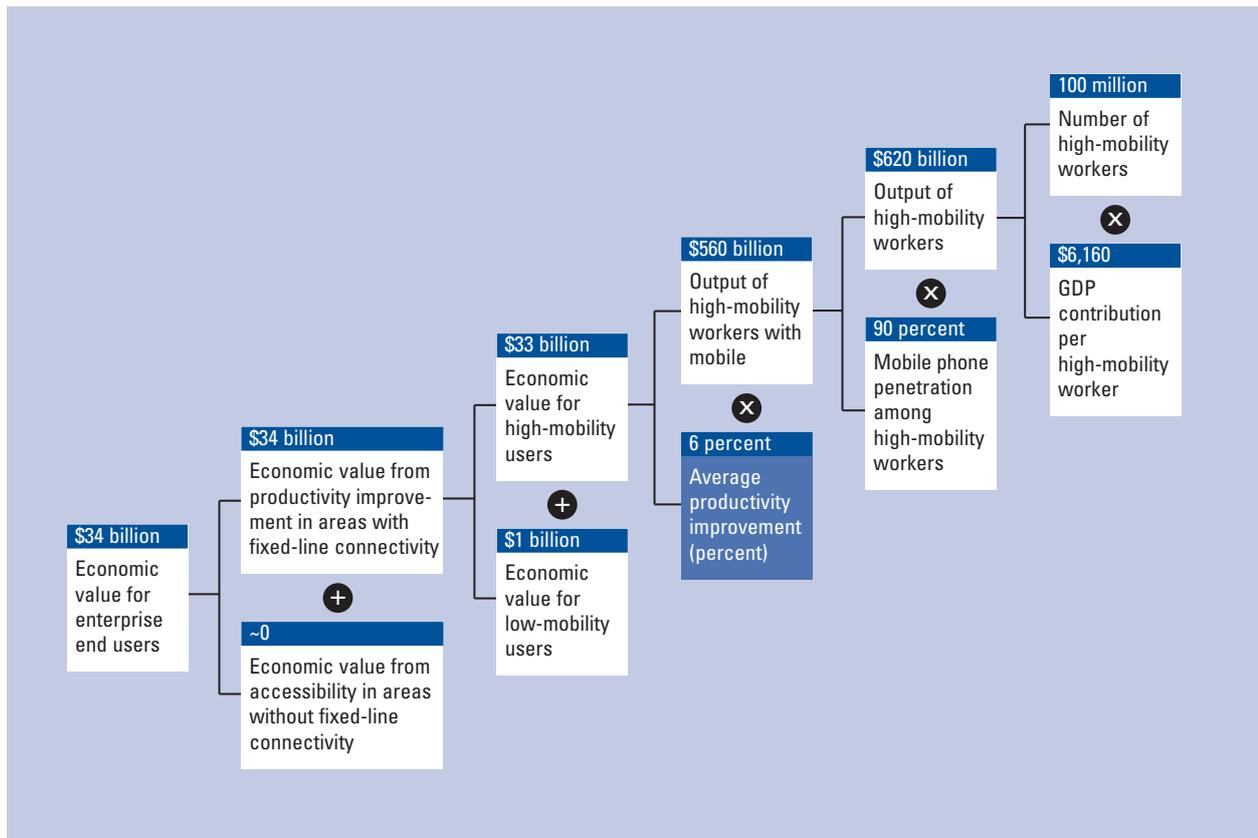
The mobile telecommunications industry has provided many innovations that are used with great success in emerging markets. Some of these are listed here:

- M-Pesa** is a mobile money service offered by Safaricom in Kenya; it offers savings, domestic money transfers, airtime purchases, and limited bill pay of such services as satellite television or insurance plans.
 - Users:** About 40 percent of all Safaricom customers signed for M-Pesa service (over 4 million of about 10.2 million total subscribers).
 - Agents:** There are more than 5,000 M-Pesa agents. Service is also being expanded to enable card-free withdrawals through ATMs.
 - Area:** The service currently works in Kenya, with pilot programs testing money transfer service between Kenya and the United Kingdom (in cooperation with Western Union).
- CellBazaar** is a service from Grameenphone in Bangladesh that allows subscribers to buy or sell over their mobile phone (i.e., short message service-based e-auction system, though CellBazaar also offers an online platform)
 - Users:** CellBazaar has more than 1 million users.
- Solar panels** are falling in price, allowing low-income subscribers in rural areas with erratic power supply use them to charge their mobile phones.
 - The **Village Phone** program launched by Grameen telecom enables poor rural subscribers to own a phone and turn it into a profit-making venture; the subscriber can buy, on credit, a simple mobile phone with very cheap billing rates to provide paid services to the people in the adjoining area.
 - Users:** There are over 270,000 Village Phone Operators in 50,000 villages.
 - Area:** Bangladesh, Uganda, Rwanda.
 - Torch phones** are designed for people living with limited access to electricity.
 - Multiple phone books** that open on a single handset were initially intended for rural India, where a single handset is typically shared by two or more families.
 - “Call Me”** service provided by Vodacom in South Africa allows subscribers to send up to five messages per day, free of charge, requesting a call back from the receiver.

Source: M-PESA: <http://www.safaricom.co.ke>; CellBazaar: <http://www.cellbazaar.com>; Solar panels: Receiver magazine #20 | Emerging markets, June 2008, <http://www.receiver.vodafone.com/20-africas-grassroots>; The Village Phone: <http://www.grameenfoundation.org>; Torch phones: Receiver magazine #20 | Emerging markets, June 2008, <http://www.receiver.vodafone.com/20-africas-grassroots>; Multiple phone books: http://www.domain-b.com/companies/companies_n/Nokia/20080402_multiple_phone_books.html; Call Me: www.vodacom.com.

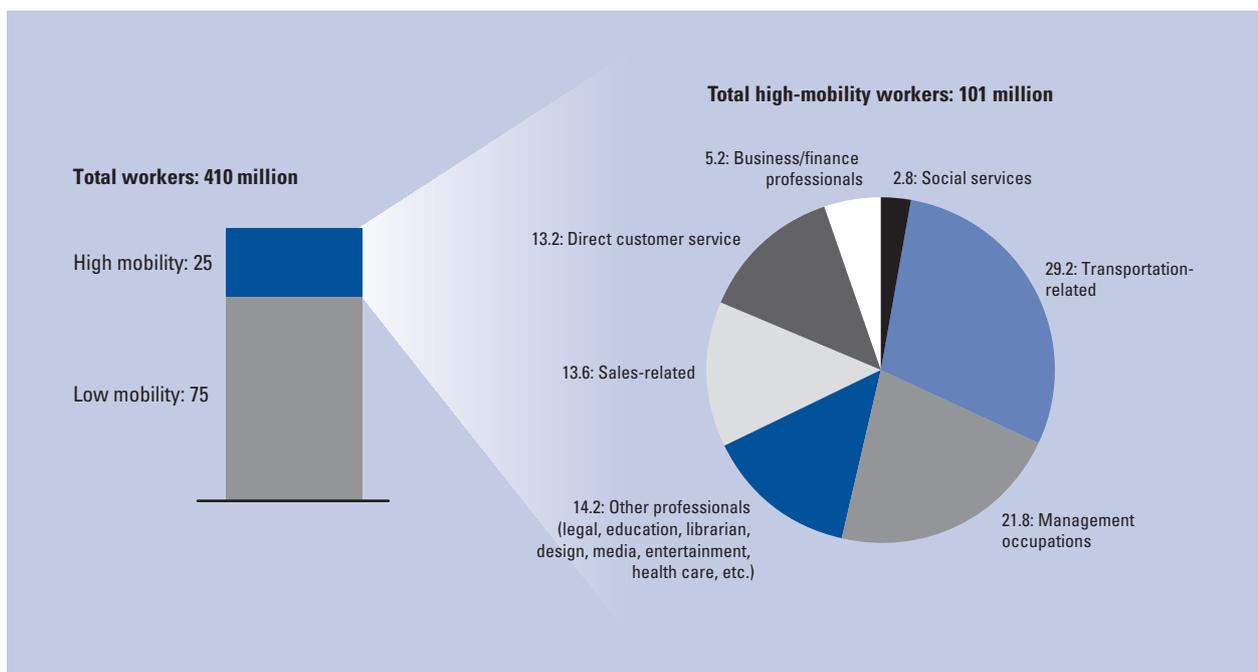
Figure 3: Economic value of mobile telecommunications industry for enterprise and end users in China, 2005

3a: Economic value and productivity growth



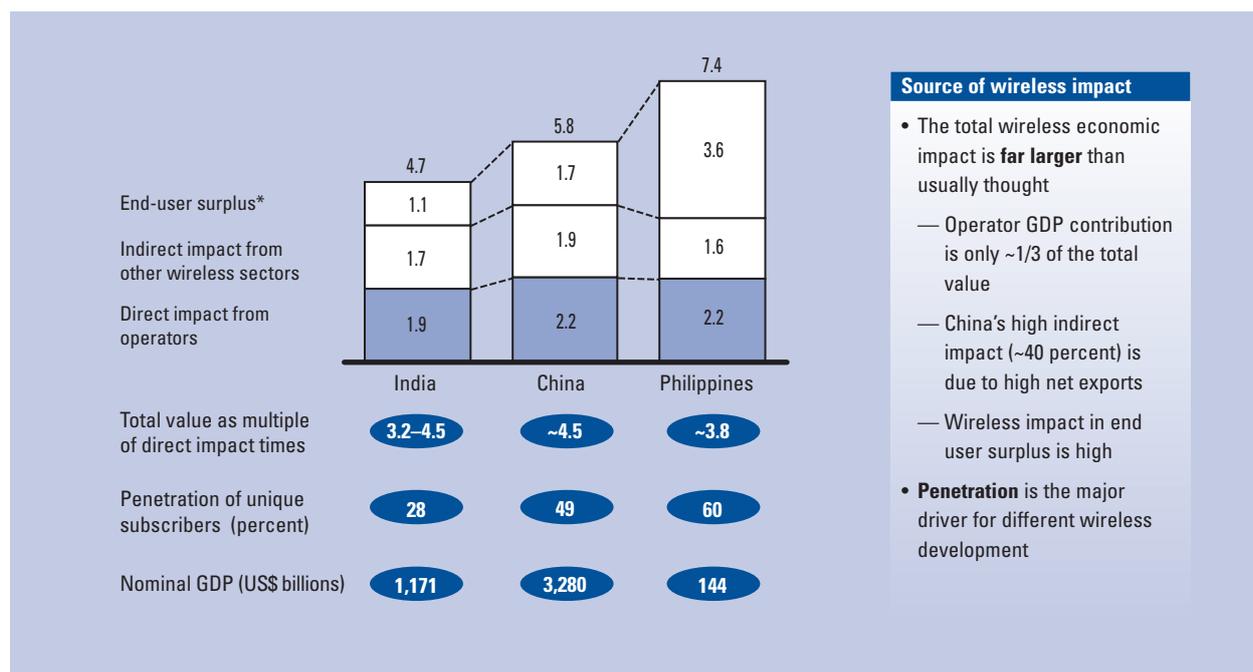
Source: ILO, 2008; China Statistics Bureau, 2005; McKinsey analysis.

3b: Composition of high-mobility workers (percent)



Source: ILO, 2008; China Statistics Bureau, 2005; McKinsey analysis.

Figure 4: Economic impact of mobile telecommunications industry in India, China, and the Philippines, 2007 (percent of GDP)



Source: ITU, 2008; EIU, 2008; IHS Global Insight, 2008; Yankee Group Global Forecast 2007; IDC, 2007; McKinsey analysis.

* Rough low-bound estimation using historical ARPU, inflation adjusted.

calculated that the economic value to enterprise end-users in China is around US\$34 billion, with a productivity increase of around 6 percent being one of the key levers (Figure 3).

To estimate the second, less tangible benefit—exemplified when workers contact their family and friends with mobile units, we used historical average revenue per user (ARPU) as an indicator of user willingness to pay. This consumer portion of end-user surplus equals ARPU at the time a customer subscribes to wireless services minus today's ARPU, and assumes the user's willingness to pay does not change over time. Thus, a Mumbai mobile subscriber who purchased the service in 2000 for, say, 300 rupees a month but now pays only 250 rupees a month (because of competition and other factors) has gained a surplus of 50 rupees a month.

Admittedly, any estimate of intangible benefits will be a rough calculation, but this one relies on actual data—the amount customers have demonstrated they will pay. In fact, we consider our estimate to be conservative, since many users would pay higher rates if necessary. Moreover, as technology, network coverage, and network quality improve over time, this form of surplus should increase.

These factors massively amplify the economic impact of the mobile industry—in China alone, in 2005 it generated approximately US\$100 billion, or nearly 5 percent of the GDP of that country. Of this, only a quarter reflected the direct contribution the mobile industry made to GDP; half came from related industries;

and the final 25 percent came in the form of the consumer's surplus. Other countries we examined displayed similar levels of total economic impact—from 3.2 percent in India to 3.8 percent in the Philippines (see Figure 4).

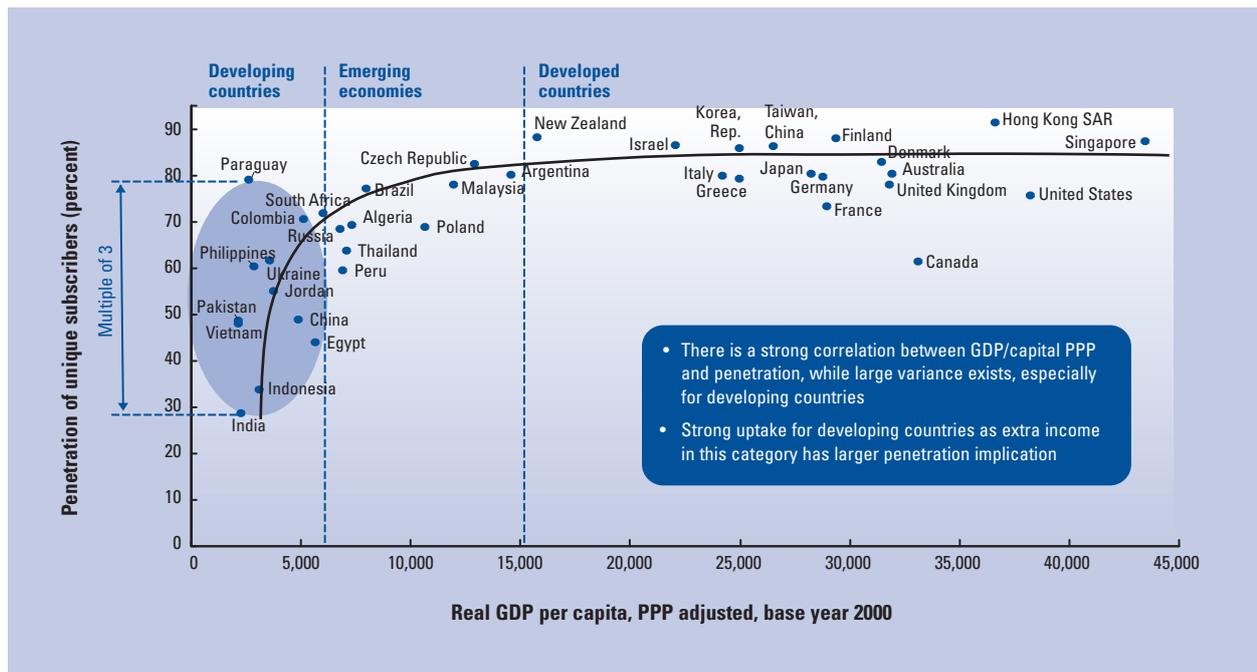
The economic impact of the wireless industry as a percentage of GDP varies from country to country, as Figure 4 also shows. This impact, for example, is higher in the Philippines, a country with high service penetration and a high degree of service innovation, than in other countries such as India, where penetration and quality of service are known to be low. The next section of this chapter describes how the economics of the industry plays a crucial role in explaining these differences.

Hurdles to high ownership levels and low prices

Achieving the maximum potential societal benefits the mobile industry can offer requires emerging market operators and government regulators to work together to significantly increase penetration rates in these countries.

However, increasing penetration rates is challenging. Figure 5 shows mobile penetration has a strong correlation with economic development. Despite this, even within countries that have achieved similar development levels, penetration rates vary significantly, and this is especially true among the poorest countries. For example, mobile penetration rates in Bangladesh, Pakistan, Peru, and Egypt range from 15 percent to 20 percent, while Jordan, the Philippines, and Colombia enjoy rates in

Figure 5: Mobile penetration rates vs. income level, selected countries, 2008



Source: WICS; EIU, 2008.

excess of 60 percent, even though both groups of countries have GDP per capita (PPP) levels of US\$3,000 to US\$5,000.

Emerging countries that have achieved high mobile penetration rates tend to get a number of things right, such as high coverage levels and low minimum cost of ownership (MCO). Doing this, as Figure 6 illustrates, depends on managing several key factors. Achieving the right network coverage levels requires managing adequately several regulatory levers such as rollout obligations, the ability to share network costs, taxes, spectrum prices, and licensing costs. Additionally it also requires favorable but not excessive returns on capital for investors, which in turn result from factors such as the cost of operations, growth prospects, and competitive intensity.

Similarly, minimizing the total cost of ownership of mobile requires lowering the upfront cost of becoming a mobile subscriber. This is represented by the amount it costs a subscriber to purchase a handset and activate a subscriber identity mobile (SIM) card (amortized over the life of the handset) and bringing down the ongoing cost of remaining an active subscriber, which in turn depends on the ongoing competitive intensity of the industry. Regulation again plays an important role in this last factor, because levers such as licensing, along with retail and wholesale prices, are key determinants of the MCO.

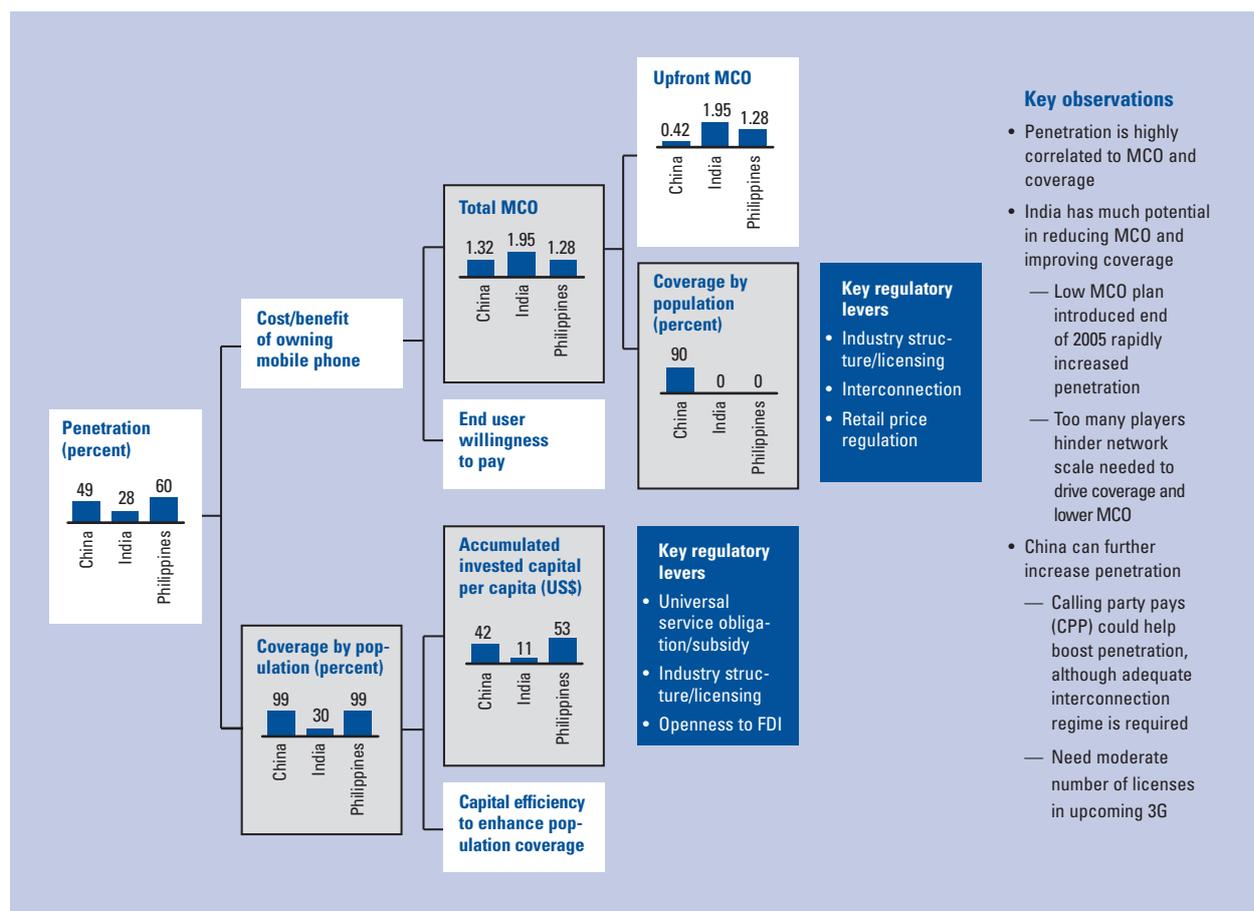
Coverage

Many observers assume that mobile coverage equates with the number of operators a market holds. In other words, they assume that as the number of mobile operators increases, the percentage of the population covered will also grow, since competition will result in lower prices and more affordable service. However, a number of examples demonstrate that the reverse can be true. Despite the large number of operators (eight) in India, for example, population coverage in that country lags significantly behind Jordan, with four operators; China, with three operators; and the Philippines, with three.

One possible reason for this counter-intuitive finding is that many smaller mobile operators focus on the more profitable urban areas and lack the resources and/or interest to roll service out to rural areas, where the majority of people reside and where the social benefits of mobile connectivity are as high, or potentially higher, than in well-served urban areas. Furthermore, as more operators enter the market and competition intensifies, the utilization levels and profitability of many carriers drop, hindering their ability to invest in the network to expand further.

The examples of India and the Philippines provide a compelling contrast. Both India and the Philippines are geographically diverse and have largely the same income levels (US\$2,600 and US\$3,400 GDP per capita PPP, respectively). However, the Philippines, with three operators having an average EBITDA margin of about 66 percent, enjoys universal network coverage (roughly 99 percent) and mobile penetration of 60 percent. India,

Figure 6: Key levers that affect penetration rates, 2007



Source: GSMA, 2007b; prepaid plans of major operators; McKinsey analysis.
Note: Minimum cost of ownership (MCO) is calculated in dollars per month.

on the other hand, with 37 percent network coverage and 28 percent mobile penetration, is a market where even the best operators rarely exceed EBITDA margins of 40 percent. While city dwellers in India enjoy perhaps the lowest mobile rates in the world (in the range of US\$2 cents/minute) because of the fierce competition among the eight major operators, coverage expansion has only recently begun for the vast but underserved rural market.

Regulators in many countries attach rollout obligations to the licensees in an effort to circumvent the tendency of the industry to focus on only a few high-income catchments. For such obligations to work in practice, operators must be well capitalized, with the financial resources needed to undertake required investments. They should also have sufficient reputation at risk to compel them to adhere to the commitments made at the time of entry. In addition, the presence of viable alternative competitive players, which *would* push ahead with similar expansion plans, provide a strong incentive for players to undertake such investments—even at the cost of upfront losses. This in turn highlights the importance of an open but healthy industry structure, with strong, well-capitalized players, as well as relatively liberal

foreign direct investment (FDI) regulations to attract the best global capital as well as robust industry operators.

Minimum cost of ownership

From the customer perspective, the main force behind rapid mobile service uptake involves the MCO, which itself is driven by upfront costs (e.g., handset purchase and activation charges) and ongoing expenses, or the minimum charges required to remain as an active subscriber. For low-end subscribers in particular, the upfront cost—even though a one-time charge—may represent a significant entry barrier.

The cheapest available prepaid plan can provide a good proxy of minimum ongoing expenses, on the assumption that many low-income users cannot afford, or are not eligible for, postpaid subscriptions.

In a rational market, operators would base their lowest subscription plans on their operating expenses (OPEX). Typically, for emerging market operators, the main OPEX items relate to interconnection costs, network operating expenses (e.g., maintenance, rentals, utilities, and personnel), depreciation, sales and marketing, and customer acquisitions, as well as license and spectrum charges.

For at least four of the five major items listed above (interconnection, network, customer acquisition, and license and spectrum charges), the industry structure and various government regulations play crucial if not decisive roles. Comparing a typical Indian operator with one in the Philippines, we find that license and spectrum charges in India amount to a noticeable 11 percent, compared to 3 percent for a proxy operator in the Philippines, marked as it is by the access deficit charge (paid to the fixed-line incumbent operator) as well as revenue share fees, which vary by the viability of the operating area.

On balance, a clear and negative correlation appears to exist between a market's MCO and its mobile penetration level. Pakistan, with a lower MCO of US\$1.13 per month, enjoys a significantly higher mobile penetration rate than India, (i.e., 49 percent versus 28 percent, respectively), where MCO is closer to US\$1.95 per month.

Getting the MCO elements "right" can have a significant impact on overall penetration, boosting the public value of putting phones in as many hands as possible. Our analysis of an Indian case study revealed a potential increase in subscribers of about 20 million by 2010, driven by a drop in MCO of 25 percent (i.e., from US\$8 to US\$6 per month).

Policy and industry implications for emerging markets

To unlock all of the benefits the mobile industry can generate in emerging markets, governments and regulators need to establish a coherent set of regulatory policies that actively increase coverage levels while reducing the minimum cost of ownership. A broader industry compact should accompany this set of policies, allowing providers to participate and collaborate with regulators in order to achieve the ultimate goals of developing the mobile industry and the overall economy of the country.

Any industry stakeholder in an emerging market should consider the following broader set of policy considerations when deciding how to increase the economic and social benefits the mobile industry generates in their respective country:

- **Ensure sufficient but not excessive competition.** In a capital-intensive industry, where large upfront investments are necessary, competition among a few players may have better results (i.e., in terms of coverage, penetration, and service quality) than hyper-competition among many. Clearly, any market needs a minimum number of players to guarantee adequate competition, but opening the market indiscriminately to many competitors may create the wrong incentives and reduce investments in new geographical areas, thereby reducing coverage and focusing competition in high-income areas. Reduced margins and duplicated infrastructure will

further hinder efforts to extend coverage and serve low-income customers. Instead, markets need to allow for a sufficient number of players with minimum economic size. India offers a good example of how too many competitors in a single market can lead to suboptimal coverage and low-quality service.

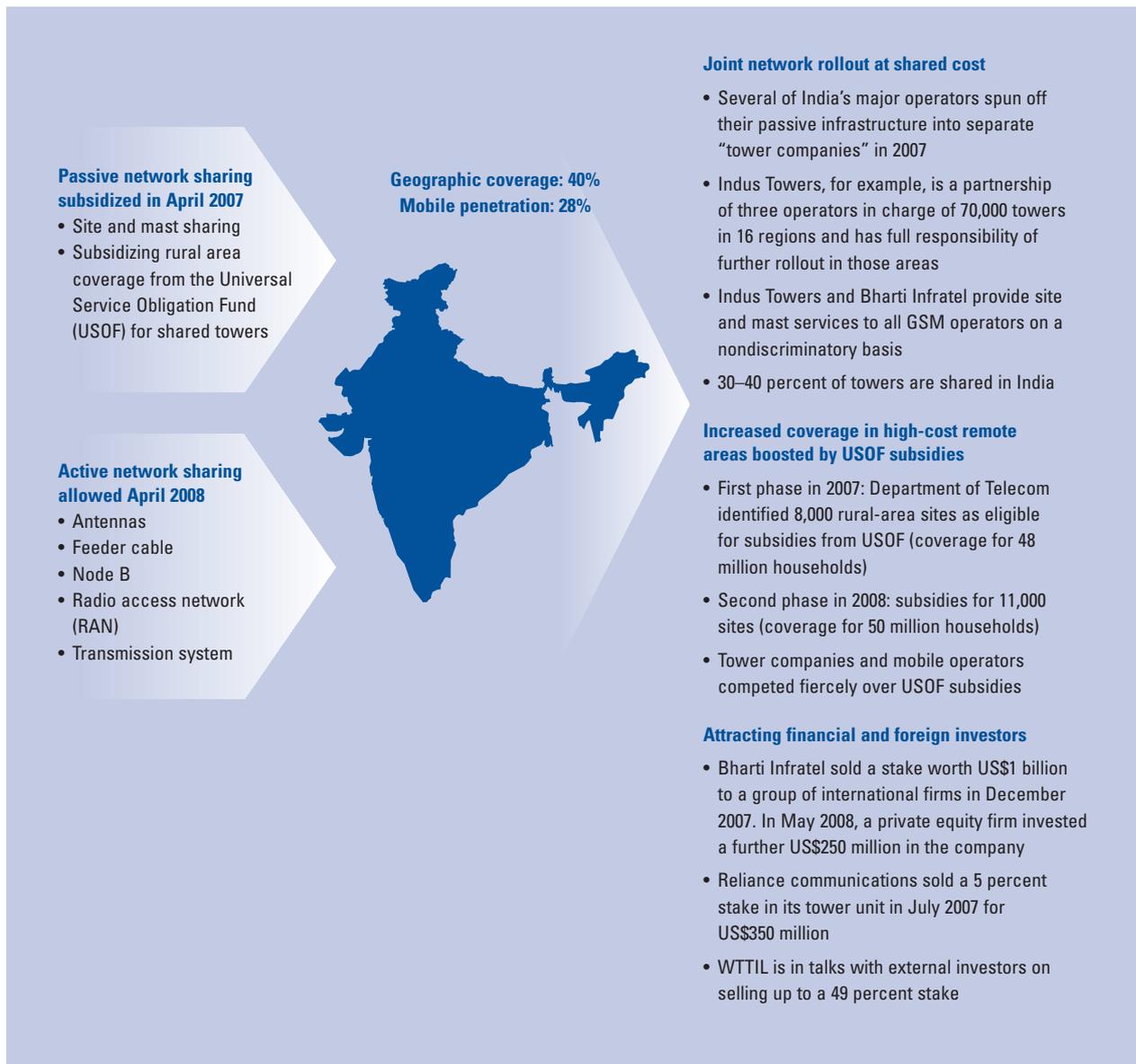
- **Avoid direct price controls.** Low prices typically retard industry returns and overall growth in the medium to long term, hampering investment levels and translating into poor customer service. Regulators should avoid mandating across-the-board lower prices as they attempt to lower the minimum cost of ownership and encourage higher mobile penetration. Such moves can backfire because mandating lower average prices will reduce operator profitability and constrain companies from taking the appropriate steps to increase penetration. Instead, regulators can lower the MCO by designing a system under which the calling party pays, supported by an appropriate interconnection regime that provides incentives to operators who price their services efficiently.

- **Attach strict rollout and coverage requirements to mobile licenses.** Increasing numbers of emerging market regulators mandate network rollout and coverage obligations when they issue new mobile licenses, in order to prevent new players from investing in rich niche areas and neglecting more low-income and remote areas. In fact, almost all of the new licenses issued in emerging markets over the past two years have stipulated some type of rollout and coverage requirement.

One innovative way in which regulators can facilitate network rollouts and increase coverage focuses on allowing network sharing among operators. This approach, extremely common in developed countries such as Australia, Germany, Sweden, and the United Kingdom can and should play a greater role in emerging markets. India is one of the few developing countries that has been an early adopter of this approach, which reduces capital investment costs and increases network rollout and geographic coverage. As Figure 7 shows, India issued several successful measures to implement network sharing. The first allows providers to spin off their passive network infrastructure in order to offer it to other providers in the market. This new passive network company receives good access to government subsidies in order to continue expanding its network. Furthermore, in April 2008 regulators allowed active network sharing.

However, given that infrastructure sharing allows operators to reduce their capital costs significantly, this is a lever that ought to be exercised with care and in selected areas, as the recovery of capital

Figure 7: Infrastructure sharing in India: Benefits in coverage and cost



Source: ITU *World Telecommunication Indicators*, 2007; GSMA, 2007b.

costs is one of the main levers of price competition in this industry of high fixed costs and minimal variable costs.

- **Effectively manage spectrum allocation and pricing.** Spectrum management has risen significantly in importance in emerging markets, and spectrum policies will play a major role in delivering telecommunication services to users. The number of spectrum licenses granted and the fees attached will have a great impact in the industry. Take India, where mobile operators struggle to obtain additional spectrum allocations in order to carry calls crisply and reliably. Indian operators claim the nation faces a "spectrum crunch"—in November 2007, for example, Sunil Mittal, Chairman of Bharti Airtel,

described the country's spectrum situation as one of "extreme anguish" caused by the "pitiful" amounts of spectrum granted to operators. As one journalist noted, "Airtel was supposed to receive an additional spectrum allocation after it passed 1.6 million subscribers. It now has over 3.6 million and it is still waiting."⁵ This situation is taking a toll in terms of the number of calls dropped per subscriber and the patchy reception they get.

The role of spectrum management policy becomes even more important when one thinks in terms of economic development implications. As noted above, the number of mobile subscribers exceeds the number of fixed-line users in many emerging countries. Because of the relatively poor development of fixed infrastructure in these markets,

questions arise regarding how broadband service will develop and hence how these countries can benefit from the productivity gains broadband offers. Rural and poor areas accentuate this phenomenon, since providing broadband services there will undoubtedly rely much more on wireless provision rather than on fixed access.

As wireless broadband technology develops and wireless applications and services expand, the main focus of spectrum management in developing countries will turn to accommodating technology and service flexibility. By adopting such flexibility, policymakers will allow operators to choose the most efficient and economically sound technologies needed to provide services to end customers.

To promote flexibility, a number of countries are already moving toward establishing technology- and service-neutral licensing and spectrum management policies. Sri Lanka provides a good example of how a developing country realized the importance of spectrum policy and began an ambitious “refarming” process in order to create a regulatory environment that encourages industry investment and economic growth (see Box 2).⁶

- **Avoid high levels of taxation.** Levying taxes on the mobile telecommunications sector has attracted government attention in emerging markets for two main reasons. First, the mobile sector has achieved strong growth in these nations in the past decade, and second, the operators’ efficient billing systems facilitate the collection of government receipts. However, mobile-specific taxes reduce demand for services, lowering penetration levels. Experience in sub-Saharan Africa clearly illustrates this point: a recent study shows that if governments withdrew most industry-specific taxes and instead imposed only value-added taxes (VAT), tax revenues from the mobile industry would actually increase 3 percent by 2012 and average mobile penetration would expand by roughly 8 percent, from 33 percent to 41 percent.⁷ This represents a significant loss in terms of economic growth, since an increase in mobile penetration of 10 percent in a typical developing country boosts GDP growth by about 0.6 percentage points.⁸

Clearly, emerging markets should not impose excessive tax burdens on their mobile industries or they will hinder the penetration of these services and the public value they can create.

This chapter illustrates just a few of the measures emerging in the market that policymakers and stakeholders in the mobile services industry should consider when deciding how to apply regulation to increase the

Box 2: Refarming for success in Sri Lanka

Spectrum management policies in Sri Lanka were virtually nonexistent in the 1990s, when regulators generally bundled spectrum with operating licenses. Up to 1996, regulators allocated spectrum on a first-come/first-served basis in the band sought by operators. Telecommunications providers paid no upfront fee for the allocated spectrum band, but instead faced an annual charge for use of the radio frequency. This policy resulted in a situation where too many different telecommunications companies applied for spectrum at different points in time using a variety of technologies for both wireless local loop (WLL) and mobile applications.

Regulators had not taken into account factors such as equity and efficiency in spectrum allocation, and the technologies used by providers to provide mobile services varied considerably, ranging from Global System for Mobile services (GSM) to Code Division Multiple Access (CDMA). The move toward a more technology- and service-neutral spectrum policy was mainly triggered by a desire to treat all providers equitably, the urging of mobile providers to shift to GSM technology, and the need to use CDMA as a low-cost solution for fixed wireless access in rural areas.

Although the Telecommunication Regulatory Commission of Sri Lanka (TRCSL) was constrained to some extent by existing allocations and defense considerations, it issued more spectrum space. The regulator also recognized the problem of scattering spectrum and attempted to streamline allocations while it cleared capacity in the 1800–1900 megahertz range. It did so by embarking on a thorough industry consultation process that involved difficult negotiations with stakeholders in the industry, which included different compensation schemes for spectrum refarming.

Decisive action by the TRCSL resulted in the fair allocation of spectrum to incumbent and new operators alike, and helped the rapid proliferation of wireless technologies, proving that a forward-looking approach to spectrum management can help to increase the penetration of mobile services and mobility in general in developing countries.

Source: Jain, 2007; Ovum Consulting 2007.

ubiquity of mobile service. Bear in mind that no silver bullet exists to increase coverage or reduce the minimum cost of ownership in the industry. These ideas can, however, create a fertile environment where the industry can flourish, delivering high levels of public value as it provides developing nations and their citizens the full benefits of mobility in the 21st century.

Notes

- 1 itnewsafrika 2009.
- 2 Telnor 2008, p. 4
- 3 Telegeography 2008.
- 4 McKinsey & Company 2006.
- 5 *The Economist* 2007b.
- 6 *Refarming* involves the reassignment of spectrum to services that provide greater economic or societal benefits.
- 7 GSMA 2007a.
- 8 Vodaphone 2005.

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