

## 3 THE ROLE OF SECTOR REFORM IN ACHIEVING UNIVERSAL ACCESS

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### 3.1 Introduction

Increasingly, policy-makers and industry experts are altering their views of un-served and under-served areas within their national borders, regarding them less as intractable problems and more as potential markets for investment, given the right regulatory conditions. Creating those conditions is a function of sector reform processes, which are ongoing in many developing nations. This chapter explores the function of sector reform movements, and particularly the development of competition, in meeting universal access goals.

The global re-examination of sector reform as a tool to achieve universal access has been prompted, at least in part, by the role that mobile services have played in extending telecommunication services to populations that have never before been subscribers to fixed-line network offerings. This chapter will, therefore, take a close look at how the introduction of competition in the mobile sector has benefited universal access efforts, and which lessons from the mobile sector's growth can be more widely applied.

Moreover, this chapter will explore the steps that governments can take to improve market efficiency. It is important for policy-makers and regulators to distinguish the *market efficiency gap* from the *true access gap*. Governments should consider regulatory reform measures before they create universal access/service funds or other specialized tools to subsidize networks or services. Such regulatory reform efforts should include establishing effective tariff and interconnection rules, pursuing technologically neutral licensing (allowing operators to make their own choices about the most appropriate technology) and, generally, reducing high licence fees and other barriers to entry.

### 3.2 Sector Reform: Fostering Competition

Reforming the telecommunication sector is a complex task, with many components and important regulatory details. The most important step in sector reform is the introduction of competition, with private sector participation and an independent regulator as a key facilitator.<sup>1</sup> Privatization – including partial privatization – has often improved the performance of operators. A good example is that of the privatization of Sonatel in Senegal, where fixed-line penetration grew 193.8 per

cent between 1997 and 2002, after partial privatization. Privatization can have a strong impact on network growth – but often, this effect is most pronounced only in conjunction with effective competition.<sup>2</sup>

While privatization does not result, automatically, in network growth, it is an important ingredient for effective competition. The State should avoid being a market player and referee at the same time. For competition to be fair, the State should not have a vested interest in any of the operators. So privatization (or at least the divestiture of controlling ownership) of the incumbent gives the industry some confidence that policy decisions and regulation are fair to all players.

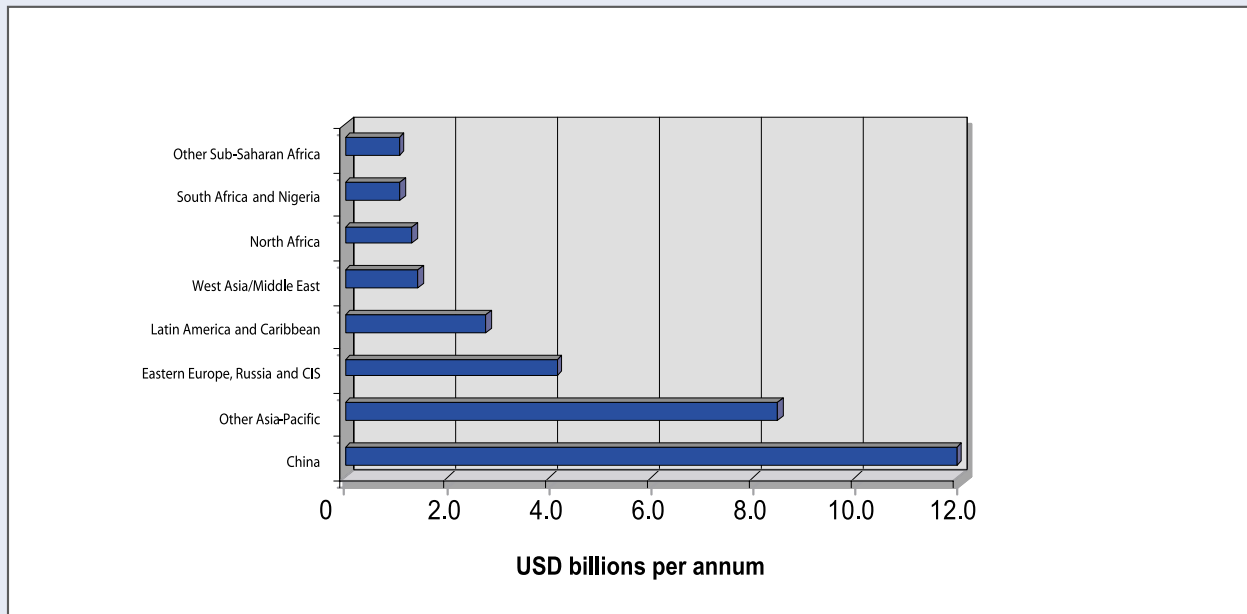
The sequencing of privatization and the introduction of competition is an important policy decision. In many cases, market liberalization has been delayed in order to achieve a higher sale price for the incumbent – in effect, propping up the value of the incumbent by giving it a cushion of monopoly rights. But with fixed-line incumbents currently facing a dim outlook for market growth, more countries may possibly go the route of Uganda. That country was one of few that introduced competition before it privatized its incumbent carrier. In 1998, it launched a second national operator, MTN, with a full-service licence. Only in 2000 did it partially privatize the incumbent, UTL.<sup>3</sup> This bold step led to a total (fixed and mobile) network growth of 282 per cent in the period between 1998 and 2001. This created perhaps more benefit for the economy as a whole than would have been created through the proceeds of privatization, accompanied by exclusivity.

The legalization of competition cannot alone guarantee network growth. Sector reform has to include the creation of an independent regulatory agency to ensure a level-playing field for competition. Some countries have introduced competition but then failed, for example, to make sure that the incumbent operator provided timely interconnection at fair rates.

Vibrant competition also generally requires more than two competitors. In a duopoly, it is too easy for the operators to divide the market between themselves through collusion or oligopolistic practices. The full benefits of lower prices, more choice and service innovation can only be unleashed with more aggressive competition between several operators.<sup>4</sup> It can also be argued that opening the telecommunication sector

**Figure 3.1: The Potential in Rural Markets**

The potential annual revenues that can be tapped for telecommunication services in selected regions' rural markets.



Source: Intelcon.

to foreign, direct investment is a vital aspect of introducing competition.

In the past, competition usually has been confined within service segments, such as data services, international call services or mobile services. The massive uptake of mobile service in many developing countries, however, indicates that mobile is increasingly a substitute for basic fixed-line service – and, in fact, competes with it. This means that the traditional perception of separate market segments for wired and wireless telephony, voice and data services is probably no longer viable today, and is certain to fade over the long term.

For example, the introduction of “limited mobility” wireless services in some countries is blurring the previous dichotomy between fixed and mobile services. In addition to competition among wireless and wireline telephony providers, there is now competition among telephone companies and data service providers, including cable TV systems in some countries. Internet protocol (IP) technology is making voice and data services less distinguishable.

Convergence has been long discussed, but it is now reaching such a level, in many countries, as to require new regulatory approaches. Governments must re-invent rules to maintain a level playing field between competing service providers that operated in completely separate markets in the past. Regulators and policy-makers will increasingly view competition as taking place between companies in previously distinct market segments.

### 3.3 Universal Access is a Market Opportunity

Many countries are concerned that competition and private-sector market participation will leave their urban poor

and their rural areas un-served, or at least under-served. The underlying perception is that the urban poor and rural areas cannot be profitably served and will, therefore, be neglected by private operators. But this is only partially true. There are market opportunities in areas that lack universal access – so much so that, for convenience, these opportunities can be captured in the term *universal access market*.<sup>5</sup> And this market (or, more accurately, this collection of potential markets) can be surprisingly vibrant. The following subsections show the size of untapped rural markets and how that size can be estimated. Moreover, the universal access market potential is not just a feature of outgoing calls, but also includes revenues from calls terminated to new subscribers in rural areas, as well.

#### 3.3.1 Rural Market Size

Rural markets in many countries can be large, representing a real market opportunity. The explosion of mobile service – with affordable prepaid offerings – in many developing countries is evidence of this. The challenge, then, is to provide the service in an appropriate and cost-effective package.

Figure 3.1 shows the annual size of rural markets, in terms of revenues, in developing countries and emerging markets, based on the affordability and income of the rural population and the average expenditures on telecommunications in each country. The detailed methodology is described in Box 3.1, which also highlights the size of some key markets (China, Nigeria and South Africa, for example) relative to their respective regions.

#### 3.3.2 Revenues from Incoming Calls

Another market opportunity lies in the volume of calls from urban areas into rural areas, which generate revenues

**Box 3.1: Modelling Rural Market Size**

Rural markets in developing countries can be modelled quite simply, based on the assumption that the overwhelming majority of the population *wants* and *demands* telecommunication services. The demand projection can be made using a modified affordability analysis based on an income-distribution curve. This method provides a relatively easy way of developing a good indication of general rural market size. It also allows comparisons between regions and key countries. It obviously depends strongly, however, on how countries classify what is rural and what is urban,<sup>6</sup> and on how reliable income distribution data are. Individual countries can be modelled in much more depth, including qualitative factors.

A conservative affordability estimate of the rural market in every country can be based on the following data and assumptions:

- Per capita gross domestic product (GDP);
- Telecommunication revenues as a percentage of GDP (giving a rough proxy for amount of GDP spent on telecommunication services);<sup>7</sup>
- Rural population;
- Estimated rural per capita income based on an income distribution methodology, where the assumption is made (conservatively) that the rural population always represents the lower portion of the income-distribution curve (that is, if 70 per cent of a country's population is rural, then the rural population is assumed to occupy the bottom seven deciles of the income-distribution curve); and
- The assumption that rural people are willing to spend/afford the same percentage of their income as the entire population. In other words, if telecommunication service revenues represent 2 per cent of GDP, then the *potential* rural market is 2 per cent of that portion of the country's GDP generated in the rural economy.

For example, African countries spend 1-5 per cent of GDP on telecommunications. The average – excluding Nigeria and South Africa, which spend about 4 and 5 per cent, respectively – is roughly 2 per cent, according to operator revenue figures available through ITU. But that 2 per cent of GDP is now recognized as an understatement of the actual expenditures for most countries when all mobile operators, ISPs and other service providers are included – and when the unrecorded income of the informal economy is included.

The recorded figures also do not reflect people's willingness to spend where there is no service available. So the current expenditure figures reflect, to a certain extent, the constrained supply of services. Recent observations indicate that spending habits on mobile service alone – not to mention unmet fixed-service demand – would far exceed the 2 per cent figure.

for carriers in the form of termination charges. Urban callers tend to be more affluent in many countries and are thus better able to afford more frequent and more lengthy calls to rural areas, where they often have relatives and friends. Data from Chile, for example, demonstrate that rural telecommunication operators earn more than 60 per cent of their revenues from incoming calls.<sup>8</sup>

Rural payphones also receive a significant number of incoming calls in Chile.<sup>9</sup> This is remarkable, because stand-alone payphones are not usually thought to receive as many calls as, for instance, telecentres or phone shops.<sup>10</sup> Publicom, MTN's payphone subsidiary in Uganda, realizes the large potential of this incoming call "market" by advertising "free incoming calls" at every payphone.

Another example of the large incoming-call revenue potential is in Bangladesh. Grameen's Village Phone programme (see Chapter 2) is a well-documented case illustrating how telephone service can be extended to low-income, rural populations. The average usage of the village phones amounts to about 1 600 minutes per month, out of which approximately 1 000 minutes are from incoming calls.<sup>11</sup>

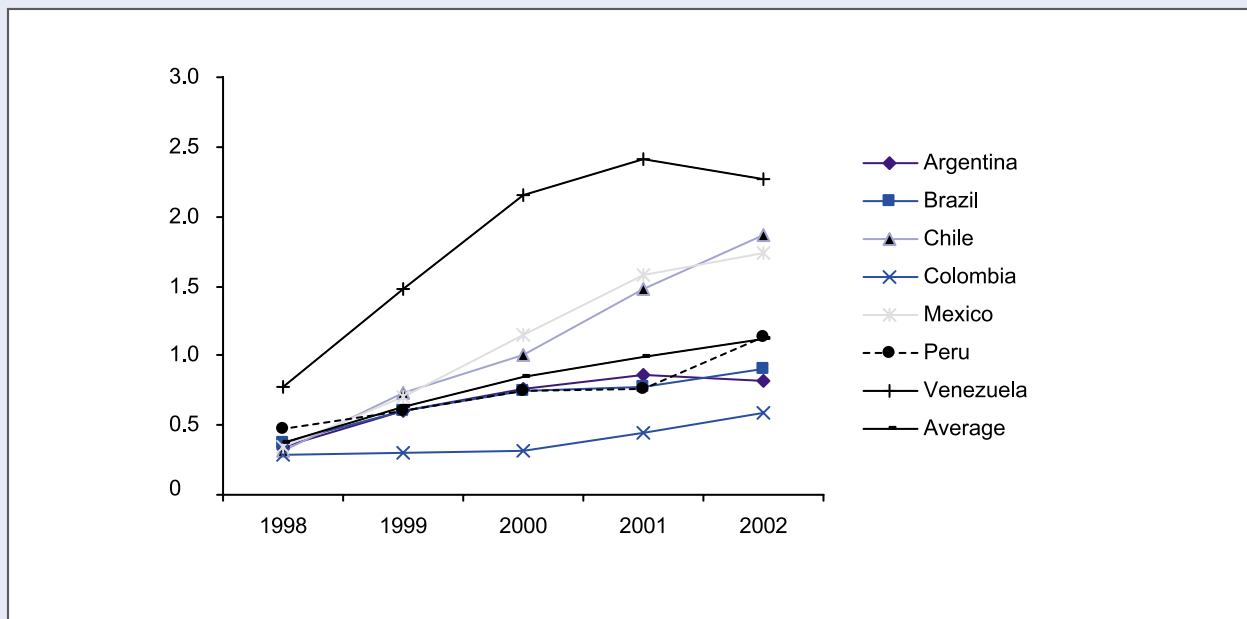
So it would be a mistake to view rural market potential as simply the sum of all revenues generated by rural populations

themselves. Revenues stemming from calls flowing into rural areas from urban (and international) calls should also be taken into account. When those revenues are added to revenues from basic service connections and outgoing calls, the total potential revenue from rural networks could be at least be double what rural users, themselves, are willing and able to spend.

**3.4 The Mobile Market Opportunity**

Yet another example of the potential of rural, under-served markets is revealed by the recent explosion of mobile services in developing countries. As noted in Chapters 1 and 2, much has been written about the impact of competition on stimulating mobile market and subscribership growth.<sup>12</sup> As Figure 3.2 shows, in Latin American countries mobile service has grown faster than fixed service, a trend which is expected to continue into the future. The same is true in Africa, where most countries now have more mobile phones than fixed lines. There, the rate of mobile service growth far exceeds that of fixed networks.

The introduction of competition in the mobile sector has achieved more than simply growth in the bottom lines of carriers. It has, in fact, greatly reduced – and perhaps nearly

**Figure 3.2: Cellular Phones per Fixed-Line Phone, 1998-2002**

Source: ITU World Telecommunication Indicators Database.

eliminated – the universal access problem for the urban poor in many of these countries. Moreover, mobile service has had a considerable impact on low-income users in rural areas, as well. The effect stems in large part from the availability of prepaid services, coupled with the development of mobile payphone services. Moreover, more rapid development of competition in many mobile markets (especially where there are more than two competitors) has forced down prices for end users. Finally, the ability of some mobile phone users to send inexpensive SMS (short message service) messages provides an e-mail substitute in many developing countries, where PC penetration is low.

### 3.4.1 Mobile Payphones

Low-income and rural customers benefit from public access to ICT services they find through public payphones, phone shops, “cybercafés” and telecentres. These public access formats allow them to spend only what they want and need to spend. Rather than subscribing to a service with a monthly rental fee and minimum usage charges, they can buy a single call at a phone shop or telecentre. For this reason, phone shops may be the most ideally suited for the lowest-income customers, because most stand-alone public payphones require the purchase of a prepaid phone card. While phone shops do not always provide 24-hour, seven-day service, they make up for that by often providing assistance to callers who may be illiterate or who may be using a service or technology for the first time. They can thus provide a smooth entry into telecommunications for previously un-served populations.

Competitive provision of mobile payphone services, moreover, can go a long way toward helping to resolve the universal access problem among the urban poor – and even among residents of easier-to-reach, semi-rural areas. Mobile

payphones are appearing in a growing number of marketable forms. In some countries, services are being pioneered by individual entrepreneurs (for example, in Cambodia, India, Nepal, Nigeria and Uganda). In others, the government is giving them a nudge through mandates attached to mobile licences (e.g. South Africa). In Chile, some rural operators have selected mobile payphones as least-cost competitive solutions. While in Bangladesh and Uganda, the business model involves establishing a network of small-scale village entrepreneurs that resell call minutes that they purchase in bulk.

Mobile technology, meanwhile, has been adapted in some places to provide fixed-wireless public payphones as well as truly mobile payphones. And wireless payphones can be found either as stand-alone fixtures or within phone shops. Table 3.1 gives examples of the various forms of mobile payphone business models.

Even in countries that do not allow mobile operators to provide payphone service (Nigeria, for example), public access businesses can spring up informally (see Box 3.2). Similar informal mobile businesses exist in many other countries – for example, in Colombia, where roving mobile resellers use sandwich boards rather than umbrellas.

The rapid growth of mobile service in developing countries is not solely a function of its technology. It also is a product of the competitive framework that regulators have established in this market segment. Many features of mobile technology allow operators to serve rural areas and low-usage clients more economically than fixed-line operators can. But even so, these customers often remain un-served in markets with only a single, monopoly mobile operator.

An illustrative example can be found in Uganda. Initially, the sole mobile operator, privately-owned Celtel, only served

**Table 3.1: Public Access and Mobility**

*Selected examples of business models in developing countries, where basic access and mobility combine to meet universal access needs.*

<i>Country and mobile operator</i>	<i>Payphone business model</i>
Bangladesh – Grameen Phone	Women entrepreneurs, recruited by Grameen Bank and given a micro-finance loan to buy a handset, operate mobile phones as public phones in rural areas.
Colombia	Mobile technology is used for the Compartel programme/Rural telecom fund, including payphones.
Ecuador – BellSouth	The operator has more than 600 payphones, many housed in restaurants, shops, gas stations and similar establishments.
India – Spice Telecom	The mobile operator recruits small-scale entrepreneurs to operate mobile phones as payphones.
Nigeria – Growing Business Foundation and MTN Nigeria	Growing Business Foundation (GBF) of Nigeria, in cooperation with MTN, launched the “Ogene Community Phone Project”, where it is using a micro-credit scheme to give women a GSM handset; loans are to be paid back within a year. See also Box 3.2 on “GSM umbrella people”.
South Africa – MTN and Vodacom	Both mobile operators are obligated to provide fixed-wireless public payphones. They are often located in shipping containers.
Uganda – MTN	The mobile operator created a unit, MTN Publicom, to provide fixed-wireless payphones using a franchise-type arrangement.

Source: Intelecon.

### Box 3.2: Nigeria’s GSM Umbrella People

Nigeria is Africa’s most populated nation with some 124 million inhabitants in 2002. Until August 2001, Nigeria had one of the lowest teledensity rates in the world. In February 2001 the government awarded three 15-year mobile cellular GSM licences for USD 285 million and the rise in the number of mobile subscribers has been nothing short of phenomenal. By December 2001, there were close to 400 000 GSM subscribers. The mobile operators managed to provide access to almost as many telephone subscribers in four months than had been installed in 40 years since independence (there were some 540 000 fixed lines at the end of December 2001). Growth has been relentless, reaching two million subscribers by March 2003. Mobile coverage was initially limited to Lagos, the largest city, and has now spread to 219 out of 550 local government areas. According to current plans, there will be some four million mobile subscribers by the end of 2003 and coverage is expected to be close to half the population. Nigeria’s business-friendly legal and regulatory environment has been cited as one of the key factors contributing to growth and investment in Nigeria’s telecommunication sector. Although handsets and prepaid cards are expensive, service is being extended to those who cannot afford a mobile handset and prepaid card through “umbrella people”.

Today, on countless streets in numerous Nigerian towns and cities, the GSM “umbrella people” are plying their wares. They are resellers of GSM wireless service – most of them young women who have settled into the business of selling phone calls, earning a high level of financial independence for themselves in the process.

Almost every Nigerian street is now decorated with umbrellas marking the stands operated by makeshift GSM resellers – thus giving these entrepreneurs their nickname: “umbrella people”. They don’t need to rent shops, and in most cases, permission to use the public space is unnecessary (or at least not sought). All they need is an umbrella, a plastic table and some chairs – and, of course, a Subscriber Identification Module (SIM) card and handset – and they are ready for business.

These impromptu businesses began when mobile service subscribers, who were able to obtain SIM cards and handsets, realized they could augment their meagre incomes by turning their phones into business assets. They could defray the cost of prepaid services (which can represent a substantial up-front investment). They could also turn a profit on GSM service resale, particularly if they could maintain a lucrative location at a prime intersection or other public location with a large flow of traffic. At this point, GSM resale has come to be a viable mode of self-employment for hundreds of young people who have to contend with the hard facts of a poor economy.

One interesting technique that has developed among the umbrella people is to procure handsets and subscriptions to each of Nigeria’s three mobile service providers, then hire “subcontractors” (often young boys or girls) to operate each handset, tripling the potential returns.

While there are sometimes technical problems and unruly customers, the roadside GSM services can be lucrative, providing at least the daily income needed to keep on with life. Umbrella people reportedly have been able to exhaust two to three MTN prepaid cards, each valued at roughly USD 11.60, in a day, depending on the location. Umbrella resellers can net as much as USD 15.40 in a single day – in a country where an employer might pay USD 38 a month.

Critics of GSM services in Nigeria have frowned at the high tariffs and substandard services rendered by operators. But there is no doubt that GSM has assumed a role in providing universal access in Nigeria, while also appearing to give low-income Nigerians an avenue for gainful entrepreneurship.

Source: Adapted from an editorial in the *Daily Trust*, Abuja, Nigeria, 29 April, 2003.

high-end business customers. Moreover, it maintained high prices for its cherry-picking services. That changed with the arrival of competition from MTN. The resulting rivalry led to reduced rates and brought rapid growth, including in the prepaid and public access markets. This is a typical pattern in many countries. MTN today has more subscribers than Celtel (almost 400 000 in June 2003 compared with fewer than 50 000 for Celtel). Still, MTN continues to face competition from Celtel, which recently introduced per-second billing to gain market share. In addition, Uganda's mobile market has also seen a third entry with the new Mango mobile service rolled out by UTL, the Ugandan fixed-line incumbent. Mango has reportedly captured more than 100 000 customers.

A competitive mobile service market might not be exactly synonymous with universal service for urban populations. But it can go a long way toward universal access in urban areas, particularly through ubiquitous availability of low-cost calling from mobile payphones.

### 3.4.2 Innovative Pricing Strategies

As previous sections have shown, the problem of achieving universal access is not just one of affordability alone, but also of developing solutions and service offerings that suit the needs and payment abilities of targeted users. The key here is to understand that almost everybody can afford to make a few calls per week, or at least per month or per year. If consumers are given a full range of choices on how much of their income (or more accurately, how little of it) they can afford to spend on telecommunications, they will spend that amount – particularly if making a phone call actually saves them from having to spend money on something else (such as a taxi). Communicating by telephone can easily result in transportation savings. Moreover, it can save time, which can be used more productively – for example, to earn income.

Competition in the mobile market, especially in the high-end corporate and business user segment, has driven many mobile operators to look to additional market segments to gain market share. This can include the potentially large, but low-margin, universal access market, which represents largely untapped potential. What operators need to tap that potential are tailored services, pricing and payment options that enable them to successfully appeal to low-income consumers.

The advent of prepaid mobile services altered the landscape for these users. First of all, mobile service provides more affordable access to telecommunication services, based on a minimal package with few outgoing calls. Table 3.2 compares the affordability of fixed and mobile service, using two cost elements:

- the start-up costs to get initial access to telephone services (i.e. a handset and SIM card activation, compared with fixed-line installation costs); and
- the monthly recurring costs to keep access and remain connected to the network (i.e. monthly rental fees or minimum monthly usage fees).

For handsets, the costs embedded in Table 3.2 can be regarded as maximums, because customers often have cheaper

options, such as through operator discounts or subsidies. Moreover, in some developing countries, there are informal handset markets and used handset markets, fuelled by cast-offs from developed countries, where consumers replace their handsets more often.<sup>13</sup> These secondary markets effectively reduce entry costs for many.

The data from a majority of the selected countries examined in Table 3.2 clearly indicate that prepaid mobile service is often more affordable for the marginal-income user, both in terms of sign-up costs and monthly recurring costs. The sign-up costs of mobile service, in fact, average almost 25 per cent less than for fixed service. The recurring monthly costs – including minimum usage requirements – for mobile services are more than 40 per cent lower than for fixed.

Mobile service may only be the more affordable choice, however, for gaining network access to make a relatively small number of calls. Mobile usage-based rates generally remain more expensive than fixed-service tariffs, but mobile operators can mitigate this by offering averaged, distance-insensitive rates across an entire national network. This would appeal to rural callers, who may make a higher percentage of long distance calls (to urban areas) than do city residents, who would make more local calls within a larger urban community.

Affordability is in many cases only one reason mobile service is chosen by low-income users. Another important factor is the ease of use that prepaid services offer. Low-income customers need more than low prices. They need the ability to control their expenditures – including the option to switch to a mode of simply receiving calls during times of economic difficulty. They also desire hassle-free sign-up procedures and other features that ease their way onto the network. Buying a prepaid card avoids any need to check a customer's credit – he or she has already paid up-front. Consumers need no bank account or cheque-writing ability to pay bills. There is no binding, long-term contract commitment. In the un-served and under-served markets where universal access is a high priority, these attributes can spell a market-driven solution to providing service.

In Africa (excluding South Africa), between 90 per cent and 95 per cent of all mobile customers use prepaid accounts.<sup>14</sup> It is likely that the trend towards prepaid service will continue. In South Africa, for example, the overall use of prepaid service is only 66 per cent, but more than 90 per cent of new mobile connections are now prepaid. Interestingly, fixed operators seem to have finally caught on to the benefits of prepaid arrangements. Examples of fixed operators having introduced prepaid accounts include N-Soft in Gabon, Brasil Telecom, PLDT in the Philippines, Telmex in Mexico, CANTV in Venezuela and Fiji Telecom.

### 3.4.3 Is There a Rural Mobile Revolution?

It is clear from the previous sections that mobile services are helping to add urban users to the public switched telephone network through competition and tailored pricing options. It is more difficult to prove, however, that competition in the mobile sector has also extended coverage in rural areas. Proving this would perhaps require a detailed comparison of mobile

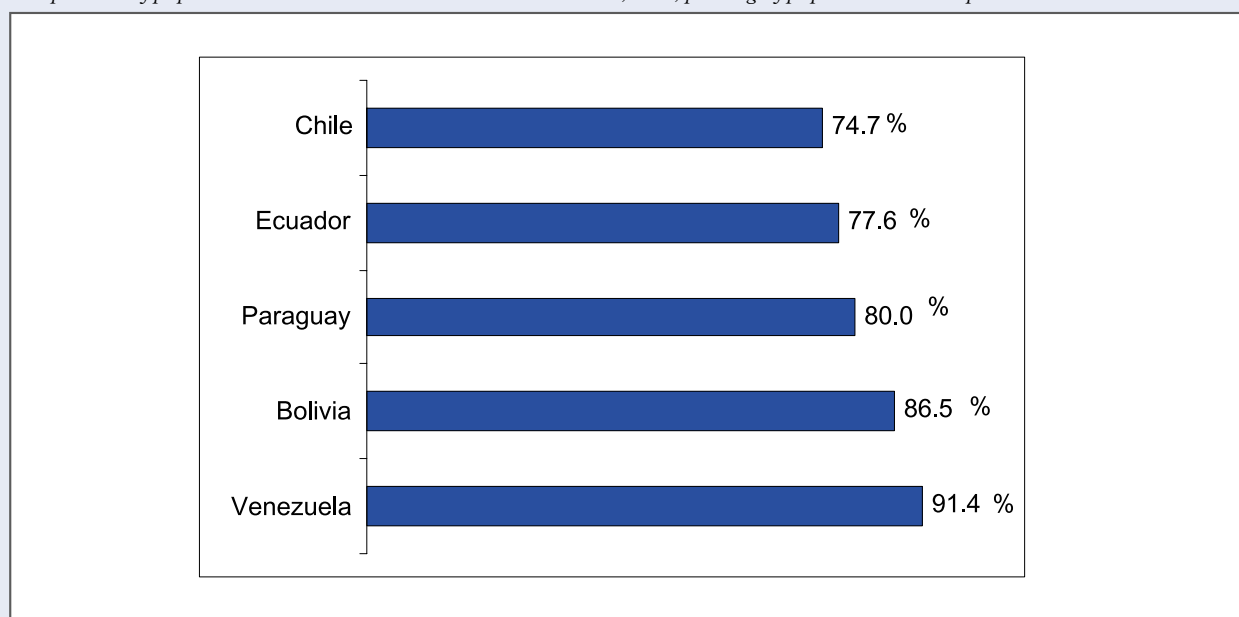
**Table 3.2: A Comparison of Fixed and Prepaid Mobile Costs**

<i>Countries</i>	<i>Start-up costs (USD)</i>		<i>Monthly costs/calls (USD)</i>	
	<i>Fixed</i>	<i>Prepaid Mobile</i>	<i>Fixed</i>	<i>Prepaid Mobile</i>
Argentina	150.00	50.00	13.65	7.95
Brazil	27.00	40.00	7.90	4.50
Chile	43.00	67.10	11.40	8.10
Colombia	168.00	49.25	3.70	4.20
Hungary	71.00	60.00	8.50	7.35
India	18.00	91.85	5.70	6.15
Jordan	141.00	62.40	4.10	2.55
Malaysia	13.00	60.00	5.40	8.80
Mexico	119.00	46.20	16.25	6.90
Morocco	47.00	45.80	6.50	2.10
Peru	131.00	60.40	13.95	4.50
Philippines	12.00	56.30	28.80	5.10
Poland	129.00	53.50	7.40	8.40
S. Africa	30.00	51.50	9.45	3.00
Thailand	84.00	89.60	2.85	1.80
Uganda	103.00	121.35	6.80	4.65
Venezuela	102.00	54.00	11.60	6.15
<b>Average</b>	<b>81.65</b>	<b>62.31</b>	<b>9.64</b>	<b>5.42</b>

Source: INTELECON.<sup>15</sup>

**Figure 3.3: It's a Prepaid World**

The prevalence of prepaid mobile services in selected countries in Latin America, 2001; percentage of prepaid subscribers compared to total mobile subscribers.



Source: ITU World Telecommunication Indicators Database.

**Table 3.3: Off the Beaten Path**

Mobile coverage beyond the urban population in selected countries, by region, 2002.

Region	Country	Pop. covered by mobile signal	% of urban pop. in country
Africa	Cape Verde	90%	53%
	South Africa	93%	53%
	Togo	90%	38%
	Zambia	50.5%	44%
Americas	El Salvador	85%	45.6%
	Ecuador	86%	63.6%
	Guatemala	68%	40%
	Mexico	89.9%	74.7%
Arab States	Jordan	99.5%	78.7%
	Morocco	95%	55.9%
Asia-Pacific	Korea Rep.	99%	84%
	Malaysia	95%	62%
	Philippines	70%	58.6%
Europe	Azerbaijan	94%	50.8%
	Belarus	72%	70.7%
	Czech Republic	99%	71%
	Slovak Rep.	98%	56.1%

Source: ITU World Telecommunication Indicators Database.

cellular coverage maps with rural settlement maps (which are often non-existent) in a representative set of countries – something that has not yet been comprehensively done.

Most of the current mobile network data indicate only the percentage of the population that is covered, not the coverage area. Moreover, these data are largely provided by the mobile operators themselves. They show, however, that a considerable percentage of the rural population is already covered by a mobile network's signal (see Table 3.3).

Figure 3.4 shows coverage maps for the dominant mobile operators in Morocco and South Africa. As can be seen, geographic coverage appears to be between 60 per cent and 80 per cent in these two countries. Only the sparsely populated or geographically challenging environments remain (partly) uncovered. These include Morocco's southwestern desert states and South Africa's western provinces. With urban populations of 55.9 per cent in Morocco and 53 per cent in South

Africa, the coverage area indicates that a large portion of the rural population is covered by a mobile signal.

### 3.5 The Market Efficiency Gap and the True Access Gap

The previous four sections of this chapter have sought to describe how, through sector reform and the introduction of competition, rural and low-income populations can be seen as representing an opportunity for market growth. But there may be limits to how well the market can or will function in extending service to all potential customers, even operating at its theoretically most-efficient level.

In order for policy-makers to design successful universal access strategies, they must be able to distinguish the *market efficiency gap* from the *true access gap*.<sup>16</sup>

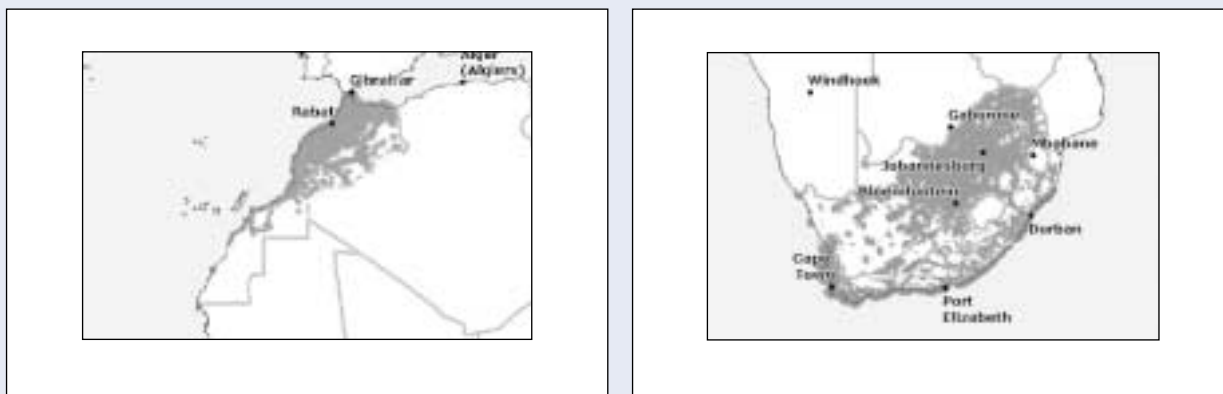
The **market efficiency gap** is the difference between what markets are actually achieving under current conditions and what they could achieve if regulatory barriers were removed and regulation were used to provide incentives. This gap can be bridged through more private provision of services, facilitated by effective competition, and by market-oriented policies and regulations that create a level playing field for new entrants. The only questions relate to how far the market can reach commercially, and how best to implement and *sequence* more competitive conditions. Effective, market-oriented regulation creates the environment for operators to be able to serve a much broader area and populace and thus close the market efficiency gap. This frontier can be reached within the context of telecommunication sector reform and does not require subsidies.

The **true access gap**, on the other hand, recognizes that intervention is still required to reach some areas and population groups that will not be served even with the most optimal, efficient and liberalized market conditions. There are people and places that remain beyond the limits of the market unless additional investments are mobilized through government intervention in the form of subsidies or other special incentives to encourage service providers to operate in these areas to provide affordable service. Policy-makers should concentrate their efforts on designing a universal access policy that identifies and focuses on eliminating the true access gap, by extending the reach of networks into marginal areas.

The challenge facing regulators is to determine the frontier between the market efficiency gap and the true access gap. Put another way, governments should first eliminate the market efficiency gap, through sector reforms and market development, before they consider mechanisms designed to correct the true access gap. Only then, when the true access gap becomes more apparent, should governments consider targeted and limited "smart subsidies" to spur extension of service to areas and populations that would not otherwise be reached.<sup>17</sup> Regulators should avoid applying subsidies that simply perpetuate the inefficiencies of the existing regulatory regime and marketplace.

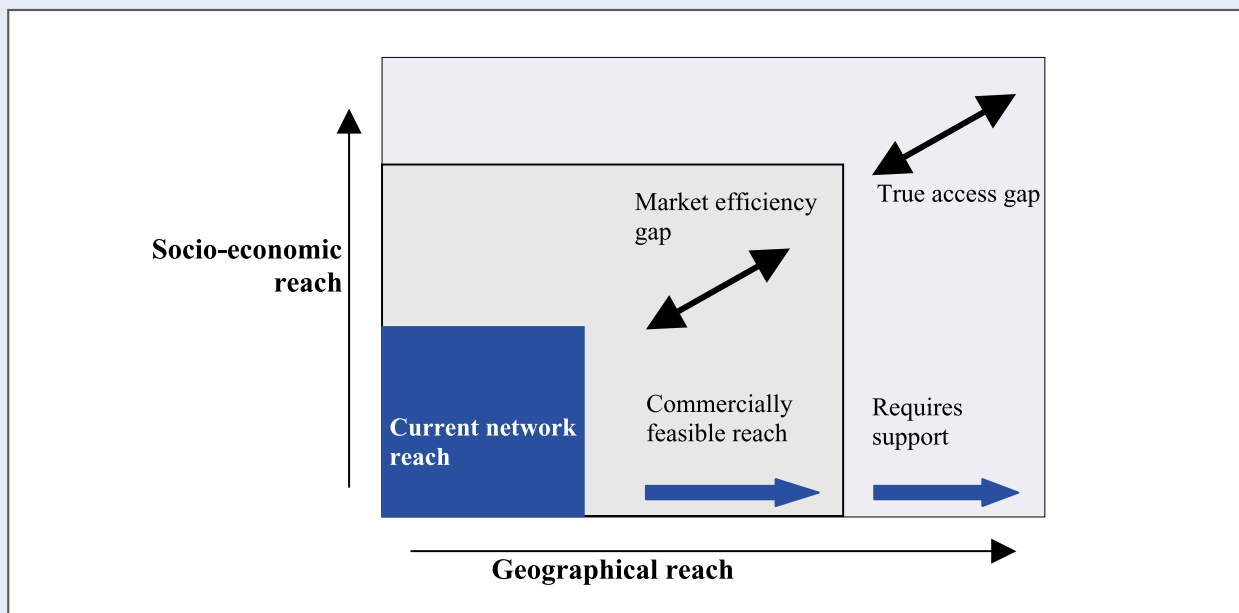


Figure 3.4: Mobile Coverage Maps for Morocco and South Africa



Source: GSM World.

Figure 3.5: The Market Efficiency Gap and the True Access Gap



Source: World Bank.<sup>18</sup>

Poverty and isolation are two key dimensions to both the market efficiency gap and the true access gap. Poverty exists, of course, in both urban and rural areas. But as explored in the previous section of this chapter, the market itself may drive operators to find pricing and marketing mechanisms to tap into low-income markets, with little or no subsidization. What is required is sufficient regulatory flexibility for entrepreneurs to package, resell and retail services freely to people who cannot afford their own private communications facilities.

On the other hand, the cost of addressing both poverty and isolation together, as exists in many rural settings, is much higher. Reaching *some* poor rural areas may be well beyond the reach of the market, in the absence of subsidization. Figure 3.5 illustrates the potential limitations of the marketplace. The two

axes illustrate the two critical dimensions of relative poverty and geographic isolation.

Defining the difference between the market efficiency gap and the true access gap points to the conclusion that the two gaps must be addressed in different ways. Subsequent chapters will explore, in detail, mechanisms to address the true access gap. First, however, the remaining sections of this chapter discuss the regulatory measures that should be considered to close the market efficiency gap.

### 3.6 Regulatory Measures to Address the Market Efficiency Gap

If private-sector operators are allowed to grow and expand rapidly, they can cover more rural areas and offer service to

more low-income customers. Therefore, directly subsidizing operators to serve rural areas, through a universal service fund (described in Chapter 4), should be only a measure of “last resort” to cope with market failure. Before a fund is created, all possible non-financial regulatory and policy measures and innovative approaches should be taken to improve market efficiency and provide non-financial incentives to operators to serve rural areas.

Without full liberalization, there is a risk that implementing a universal service fund in an immature market may be too costly and may fail to address the true market gap. In effect, it could simply underwrite and perpetuate the very inefficiencies that are creating the market efficiency gap. To achieve the full potential of sector reform and liberalization – and thus to bridge the market efficiency gap – the following sections describe several market reforms regulators can implement.

### 3.6.1 Technology Neutrality

The overall success of liberalization in the mobile sector points the way toward competition for all technologies and services. Regulators should consider moving to implement technology-neutral regulations and licensing to promote competition in the provision of a full array of ICTs. The European Union’s evolving regulatory regime, for example, shows a clear direction toward a single regulatory regime for all types of networks and services, aiming ultimately to achieve technology-neutral regulation and licensing.<sup>19</sup>

Similarly, Malaysia’s licensing regulations<sup>20</sup> take a fully “converged” approach to the regulation of telecommunications, broadcast and online services. An “applications service provider individual licence” (as opposed to a class licence) may be granted to an entity providing any or all of the following:

- PSTN telephony;
- public cellular telephony services;
- IP telephony;
- public payphone service; or
- public switched data service.

Therefore, under the Malaysian framework, even IP telephony is treated as just another licensed service, as is PSTN telephony. The Malaysian framework goes even further, licensing other non-telecommunication applications in the same technologically neutral fashion.

The advantage of technology-neutral licensing is that the licensed operator can choose and mix technologies to serve different areas and customer segments, as appropriate. This helps to minimize costs and maximize operating efficiency, narrowing the market efficiency gap.

With technology-neutral licensing, for instance, mobile operators then would be free to use fixed network elements where they see fit (possibly to serve business and corporate users, or for backhaul networks). Or, they could use satellite links, fixed-wireless networks or IP telephony to serve selected users or in particular parts of their service areas. Similarly, wireline operators could seek frequency rights to use mobile or fixed-wireless technologies where they would be more economical. Again, this would provide greater efficiency and

greater profitability, allowing carriers to reinvest in rolling out networks and services at the limits of their networks and to marginal customers.

This could also brighten the capital investment horizon for incumbent, wireline operators in countries that are struggling with privatization. Having the freedom to choose and mix technologies may well make these carriers more attractive to investors.<sup>21</sup> In Uganda, for example, the second national operator, MTN, has such technological flexibility. And licences in Nigeria now allow the use of a mix of mobile and fixed technologies to meet demand. Following through with technology-neutral liberalization and regulation could help many developing countries still pondering liberalization and could create a more favourable response in capital markets.

### 3.6.2 Price Regulation

Understandably, many regulators want to keep tariffs low, especially in rural areas, because they know affordability may be generally lower there than in urban areas. It has been a common regulatory practice and policy in the past, after all, to keep rural rates low, even in most industrialized countries. Regulators should not simply transfer that practice, however, to developing countries, where it may not be appropriate. In developing countries, operator revenues may be smaller across the board. Operators may not have huge urban and suburban markets to generate cross-subsidies that allow them to provide artificially low rural prices. As a result, the task of building out networks to the entire country may lag and suffer.

In fact, requiring artificially low rural rates may even have exactly the opposite effect than what is desired. If operators are not allowed to charge tariffs that allow them to recover costs or establish reasonable profit margins in costly rural areas, they are likely to avoid providing service in those areas at all. This is the classic conundrum of universal access, and it can result in either the delivery of very poor, spotty service or no service at all.

Certainly, the ultimate goal of universal access/service policy is to provide a foundation for affordable services in all areas – including rural ones. It might be beneficial, however, for regulators to allow operators, at least for an initial period, to price their services above those in urban areas. This could motivate carriers to build out infrastructure in rural areas. Again, the best evidence that this works are the many mobile operators in Africa that have been allowed to charge higher tariffs. The combination of tariff flexibility and competition has allowed (or perhaps forced) mobile operators to grow more rapidly, become more competitively lean – and venture into rural markets.

The impact on rural customers of slightly higher tariffs may not be as detrimental as policy-makers may fear. Low-income rural customers can (and usually do) develop innovative cost-minimizing methods of using new networks to meet their needs. They may share phones or accounts, or they may employ call-back or “beeping” techniques to signal urban callers to phone them. Those urban contacts may be more willing and able to pay for the calls, but those calls still generate revenues.

### 3.6.3 Encouraging Public Access and Resale

As indicated earlier in this chapter (and in Chapter 6), there are many low-scale, sustainable business models that can provide rural customers with services tailored to their needs and income levels. Phone shops or “public call offices” (PCOs) owned by local entrepreneurs are hugely successful in countries such as India, Indonesia, Morocco, Nepal, Peru, Senegal and South Africa – including in rural areas. These kinds of public access venues are perhaps the best models to serve low-income users in both urban and rural environments. But if they are to grow and serve rural areas, they must overcome the following three obstacles:

- The lack of existing infrastructure in rural areas,
- Heavy-handed regulation that hampers entrepreneurship, and
- The lack of actual entrepreneurs or market entrants to develop, facilitate and manage a network of rural PCO or resale businesses.

Several solutions to these problems are emerging, and policy-makers should be aware of them and, perhaps, take steps to foster them. These positive developments are outlined in the following sub-sections.

#### 3.6.3.1 Innovative Financing Alternatives for Mobile Networks

Both mobile operators in Nigeria have reported that local entrepreneurs and prepaid card dealers have approached them, offering to help finance or form cooperative ventures to expand the operators’ networks into new areas. This concept of local financing of network construction could be called a “finance-lease-share” (FLS) model. A local entrepreneur offers to finance one or more wireless base stations in a certain area where he or she detects pent-up demand. Under this scheme, the network could be owned by the entrepreneur but leased to the operator, on a “lease-to-own” basis. The operator eventually takes over the base station and other infrastructure, securing a network extension with no risk or capital outlay. The entrepreneur, meanwhile, may share the revenues during the lease-to-own period, earning back the initial investment, plus significant profits.

Policy-makers and regulators may want to consider supporting such market-based mechanisms where they may be appropriate. Such small-scale, locally based ventures, if they occurred and were repeated in a widespread way, could result in significant network expansion, while in the process supporting local economic growth. One of the Nigerian mobile operators is forging ahead with a programme along these lines, and similar schemes are thought to be viable in India and other emerging markets.<sup>22</sup>

#### 3.6.3.2 Reducing Regulatory Barriers

Sometimes, regulatory barriers prevent mobile network operators – and other terrestrial and satellite wireless companies (for example, VSAT dealers) – from providing access to public voice networks. The PSTN is often seen as the exclusive domain and right of the incumbent, fixed-line operator. This is especially the case where mobile technologies, such as

GSM-based fixed desk-top phones, can be adapted for fixed services.

Regulators may want to review whether these kinds of bans or proscriptions are truly required in existing licences and, if so, whether they should allow operators to renegotiate their licences to incorporate non-traditional, innovative or adapted technologies for basic voice telephony. In a few countries, basic service operators that offer Wireless Local Loop (WLL) services may tolerate the presence of mobile payphones – but in return, they expect the mobile operators to acquiesce in allowing “limited mobility” basic services. Several WLL technologies (e.g. Code Division Multiple Access “CDMA”) allow the user of a mobile handset to move within the WLL cell. This permits “limited mobility” – although how limited may be subject to debate. In some cases, this may mean mobility within an entire city, with prices equal to those for fixed services (which may be appreciably lower than for mobile service). Limited mobility services are popular, for example, in China, India, Nigeria and Russia.

In addition to flexibility regarding the types of services carriers may offer, governments may wish to consider liberalizing the resale market, allowing local entrepreneurs to market services that are adapted to local conditions. Some countries have developed special payphone licences (Nigeria and Russia, for example) allowing a payphone company to resell the services of other network operators.

#### 3.6.3.3 “Rural Virtual Network Operators” (RVNOs)

Public call offices (PCOs) appear to thrive where they have the active support of network operators (for example, in Morocco or Senegal). The network operator usually must offer an attractive revenue share to the PCO retailers. Moreover, the operator may want to regulate, to some extent, where PCO affiliates (or franchises) are located, as well as their proximity to each other. The goal may be to ensure that each PCO is viable and can net an optimal amount of income without siphoning off customers from another PCO.

Of course, not all carriers are interested in operating or sponsoring PCOs or other types of payphones in rural areas. If an operator finds it too complicated to manage rural PCOs, another commercial entity – a “virtual network operator” – could develop a PCO retailing business. This is similar to the model of the well-known Grameen Phone enterprise in Bangladesh (see Chapter 2). “Virtual operators” do not own and operate networks themselves. Rather, they resell bulk air-time from actual network operators, concentrating instead on marketing and sales tasks. The benefit of “rural virtual network operators” (RVNOs) is that they may have strong and mutually beneficial ties, both with the upstream national carrier and with the local communities, bridging the gap between national priorities and local needs.

### 3.6.4 Interconnection

Non-discriminatory and effective interconnection agreements are a regulatory pillar of market liberalization. They are particularly important in rural markets, because the setting of fair interconnection rates can actually limit the size of subsi-

### Box 3.3: A Rural Virtual Network Operator (RVNO) Project in Africa

Nigeria has been selected, under the World Bank/InfoDev's African Connection initiative, for testing the viability of adapting the Grameen "village phone" public-access model to Africa. The objective is to bring together virtual network operation (essentially bulk air-time resale, managed by an intermediary) and micro-finance capitalization to empower village entrepreneurs to become public telephony resellers, thereby extending the reach of GSM mobile networks deep into rural areas.

Nigeria was seen as having good potential to develop this kind of business, because of the country's high population density and the dynamic growth of its mobile market. Moreover, a micro-finance pilot project (the "Ogene Community" Project) (see Table 3.1) was already under way in Enugu state for a year, involving 25 rural women and already helping to develop a village phone model.

The micro-finance scheme was created by the Growing Business Foundation (GBF), in association with community-based organizations and in partnership with the leading GSM operator, MTN. A second pilot project, with 25 women, began in Akwa Ibom State in June 2003.

One of the challenges facing the Nigerian projects, however, is the intense competition that quickly emerges between the micro-credit clients and other informal air-time resellers (see Box 3.2 on the "umbrella people") in areas where the GSM signal is strong (mainly urban areas and along major highways). The competitive pressure quickly forces retail margins down, to the point where profitability from selling public telephony service is minimal. But the African Connection pilot is breaking new ground by investigating the potential for micro-financing to penetrate "deep rural" localities, where signal reception is still possible but competitive pressures are lower and margins a little healthier.

The initiative eventually will involve a third project, including 25 rural entrepreneurs in three states. The pilot will use various technical enhancements, such as an external antenna and solar-power panel, to enable entrepreneurs to offer public access service well beyond the usual reach of mobile networks – but still within base station coverage range (which can be up to 35 km).

The basic question to be investigated in Nigeria is whether it is feasible to manage a large network of village-based public telephony resellers. The project will particularly explore whether, in the Nigerian context, it is possible to establish a sufficient operating margin for the entrepreneurs to pay back their loans *and* earn profits. Several challenges have to be faced:

- Network costs are high in Nigeria, and the bulk discounts available from the GSM operators are relatively low. This is due to the challenging terrain and security-related expenditures required in the Nigerian market.
- Ironically, Nigerian informal entrepreneurial practices may be more aggressive – and the availability of local/informal capital for resellers may be better – than in other countries, resulting in greater competition for the RVNOs in the public access market.
- The Grameen model may be relatively uniquely adapted to its original setting in Bangladesh, where Grameen Bank has a nationwide micro-finance and rural branch network. Moreover, Grameen Bank also has an ownership stake in both the Bangladeshi GSM network provider and the virtual operator managing the village phone programme. In Nigeria, as in most African countries, there is no such combination.

On the other hand, careful selection of the loan-recipient localities, and the use of rural GSM extension technology – the technical enhancements – may give the Nigerian projects a boost. The technical enhancements may allow the phones to operate in remote places, up to 35 km from existing GSM base stations, compared with only 0-15 km with normal mobile coverage. The extended range approach will create certain advantages for RVNOs. Price competition could be less drastic than where "umbrella" resellers are active, resulting in better support for the virtual network managers and the village phone retailers.

One important feature of the pilot project is, therefore, the creative use of demand surveying and location screening to identify the zones where untapped demand exists and where the micro-credit village phone concept can be successful. The pilot will focus on identifying this niche, sizing it, summarizing the business model and providing advice on the conditions for successful exploitation.

If sufficient rural market potential exists in densely populated countries like Nigeria for an RVNO and micro-credit partnership, it should be possible to induce GSM operators to expand their networks to meet this newly cultivated rural customer base. This can help introduce universal access, in a market-driven way, to rural areas that would otherwise have little or no access to telecommunication services.

dies required to achieve universal access. Ideally, developing countries should explore implementing an asymmetric interconnection regime, based on the principle of geographically de-averaging termination rates for operators serving rural areas.

In most countries, the fixed interconnection rate between operators does not vary according to whether the call is terminated in an urban area or in a rural area. This fixed interconnection rate is developed to reflect the national, average cost of an operator to terminate incoming calls from another operator. But maintaining an averaged termination rate throughout the entire country will likely mean that operators in high-cost rural areas will recover relatively fewer of their costs through call termination – a strong disincentive to serve those areas. Geographic de-averaging, on the other hand, allows interconnection rates to reflect more closely the costs of terminating a call in a less costly urban area or a more costly rural area.

An interconnection regime that allows different network access charges, based on geographic variation in operators' costs, would obviously require a fundamental movement away from nationally averaged rates. Despite huge potential benefits for rural telecommunication development, it could place another burden on regulators. Furthermore, the differentiation of interconnection rates could breed technical issues relating to numbering, call accounting and inter-operator billing, which would pose obstacles in some countries. Nevertheless, the costs of maintaining inappropriate interconnection practices, coupled with weak regulatory enforcement, are manifest. Difficulties with interconnection, in short, have plagued and hindered the emergence of true multi-operator competition, which could already have benefited rural areas greatly around the world. There are three primary justifications for establishing asymmetric interconnection rates:

**Rural network costs can be much higher than urban network costs.** This is partly because of lower user density, which can be as low as one per square kilometre in rural areas, compared with hundreds or thousands of users per square kilometre in urban areas. While the number of potential customers doesn't affect the network costs themselves, it provides a much lower customer base, in rural areas, from which to recover those costs. Even for mobile networks, new base stations in marginal, non-urban areas often serve fewer than 10 per cent of the number of customers than the national (mainly urban) average.<sup>23</sup>

Other factors, however, directly add to network costs, including longer local loops to reach dispersed customers, inadequate power supplies and support structures, and, in many areas, rugged terrain and harsh climatic conditions. Operational costs such as maintenance and transportation are also higher. While much has been written – mostly by promoters of wireless technologies – to prove that wireless network costs are declining (see Chapter 7), the cost reductions are spread throughout the network, not concentrated in rural areas, at least for national networks. The *differential* between rural and urban network costs remains, meaning that rural networks are usually still at least 6-10 times more costly to establish and operate than urban ones. This alone may justify higher termination rates in these higher-cost areas.<sup>24</sup>

**A pricing structure that better reflected comparative costs would contribute to economic efficiency.** Many people assume that geographical price averaging is socially just and therefore good. But an argument can be made that averaging is counter-productive because it starves high-cost rural areas of investment dollars – a dangerous circumstance in an environment in which capital is already constrained. Nor can it be assumed that universal access/service funds can carry the entire burden of building out networks in un-served or under-served markets. Governments should perhaps consider, then, whether they can narrow the market-efficiency gap by moving termination charges closer to actual cost – even if the entire cost differential is not made up.

**Users will pay higher tariffs for rural telecom services that do not exist today.** There is strong evidence that users in developing countries are generally willing to pay higher charges to cover the cost of higher interconnection rates. This comes from studies indicating that low-income people will pay at least the world average of 2-3 per cent of their incomes on telecommunications. Also, user surveys reveal that consumers would pay extra to be able to call their relatives, friends or business associates in rural communities – if those individuals were connected to the networks.<sup>25</sup> The worldwide data regarding “calling-party pays” (CPP) billing shows that callers generally are accustomed to paying higher retail tariffs to cover termination charges paid to mobile service providers. This suggests that users would similarly become accustomed to higher charges to cover the interconnection and termination costs of rural network operators.

These arguments are most relevant to developing countries that are striving for *universal access*. In these countries, there is still a critical need to develop rural networks under conditions of constrained resources. Policy-makers in industrialized countries may well recognize the cost justifications for asymmetric interconnection, but they do not face the same imperative to fund the construction of rural networks. They can choose to maintain geographically averaged tariffs, pursuant to *universal service* policies, covering differential costs with subsidies rather than interconnection charges. This may be considered a luxury that resource-rich countries can enjoy, but which the majority of developing countries may not be able to afford. If consumers are willing to pay slightly higher charges for calls terminated in rural, universal access areas, that may be seen as a critical justification for asymmetrical interconnection rates.<sup>26</sup>

This being the case, the availability of asymmetric interconnection would also provide a better commercial foundation for potential investors in rural telecommunication ventures. Similarly, it could help in eliciting responses to tender calls for bidding on rural licence subsidies through universal service or rural development funds (see Chapter 5). By creating higher interconnection revenues, asymmetric interconnection could tap the incoming-call revenue stream that is available to help fund rural networks. Public payphone providers could receive a share of the incoming call revenues, motivating them to develop the market for incoming urban-to-rural calls by introducing messaging and “voicemail box”, among others (see

**Table 3.4: Asymmetric Interconnection in Chile***Chilean access charge rates (US cents per minute)*

<i>Company</i>	<i>Localities</i>	<i>Peak</i>	<i>Off-peak</i>
CTC-national	All	1.0	0.2
CNT-regional	Cities	1.5-2.4	0.3-0.4
	Towns	3.1	0.4
	Rural areas	7.2	1.2
<i>Rural operator</i>	<i>All</i>	<i>18.7</i>	<i>9.3</i>
Mobile operators	All	21.1	14.8

*Source:* Tariff decree of 1999 and CTR data for July 2001.

Table 2.1). These features would improve access to telecommunications for a much wider segment of the population.

Asymmetric (dis-aggregated and cost-based) interconnection is thus one important mechanism in helping to close the “market efficiency gap.” It can spur the market to work more effectively and prompt carriers to extend the reach of their networks farther into the rural heartland. Policy-makers can then reserve subsidies from universal access funds to concentrate on the true access gap that may still exist in rural telecommunications, beyond the limits of the marketplace.

### 3.6.5 Minimizing Regulatory Fees and Costs

In order to allow market growth, policy-makers and regulators can minimize regulatory fees for operators and service providers that specifically target rural areas. This will lower the rural operators’ costs, potentially making the difference for operators between non-viability and profitability. Moreover, environments with few regulatory constraints are apt to be more attractive to investors. In general, fees such as spectrum fees and licensing fees can be aligned with administrative costs.

Other options the regulator could propose and promote are tax moratoriums for operations in rural areas or reductions in import duties for telecommunications and other ICT equipment and accessories, such as power generators. Segregating rural revenues and operations from non-rural ones may, however, be an auditing challenge for purposes of tax breaks and other amnesties directed solely at promoting rural universal access.

### 3.6.6 Promoting Internet Access

The potential for meeting demand for ICT services through the extension of Internet access service to rural areas – and through public access vehicles such as telecentres – has been much trumpeted, discussed and piloted in

recent years (see Chapter 6). The policy approach to Internet access need not be different, in its basic form, than for voice services. That is, policy-makers should focus first on creating a supporting environment for market development of services rather than immediately providing direct subsidies. Indeed, it is especially crucial for governments not to distort the development of a nascent emerging market, and any funding should be kept to a minimum. Measures to promote Internet market development include the following (only two of which involve any direct financial support):

- Remove any barriers to the development of the Internet and ICT services market, such as allowing IP telephony, setting nationwide local call tariffs for Internet dial-up service, establishing simple and rapid licensing procedures for ISPs, providing for access to (international) bandwidth and promoting national Internet exchange points (IXPs).
- Develop and make available online access to public services (e-government, tele-health, tele-education, etc.) in order to stimulate demand in telecentres.
- Offer subsidies for developing Internet infrastructure – for example, small subsidies to establish Internet Points of Presence (POPs) in every rural district (this is now being implemented by the Ugandan Rural Communications Development Fund).
- Promote an awareness of small-scale, entrepreneur-driven telecentres through conferences, workshops and training opportunities.
- Where commercial markets do not provide service, offer financial support from universal service funds to telecentre start-ups through competitive bidding procedures.
- Develop guidelines and requirements to improve the prospect that commercially run telecentres can fulfil the function of assisting rural and low-income communities in their social and economic development.

## 3.7 Conclusion

This chapter has shown that, in order to achieve universal access, regulators and policy-makers need to distinguish between the market efficiency gap and the true access gap, and address the market efficiency gap first. This is because, under the right conditions, low-income and rural customers present a market opportunity, obviating the need for subsidization. Mobile operators have shown that this market can be reached and served through innovative service and pricing packages.

In order to bridge the market efficiency gap, however, competition must be introduced and entrenched, through fair and transparent regulation, creating a level playing field and providing a sound environment for investment. The cornerstones of effective regulation are fair interconnection, flexible tariff regulation, and licensing that allows operators to choose the most appropriate and cost-efficient technologies.

<sup>1</sup> An interesting case is China which has introduced only limited private sector participation so far, but competition to some degree among several State-owned telecom operators.

<sup>2</sup> See the comparison of Argentina and Chile in ITU's *World Telecommunication Development Report: Reinventing Telecoms*, 2002, p. 42.

<sup>3</sup> ITU World Telecommunication Development Report, 2002, p. 14.

<sup>4</sup> ITU World Telecommunication Development Report, 2002, p. 45.

<sup>5</sup> In using the term "universal access market", this chapter does not necessarily assert that any given area by itself would meet the criteria for being classified as a distinct market, as defined by competition or antitrust law or economics.

<sup>6</sup> In Latin America, the tendency is to classify individual farms, farmland and very small hamlets as rural while larger population concentrations (e.g. 1000 to 5000 inhabitants) are, in some Latin American countries, considered urban. In contrast, in Nigeria population settlements of over 10000 inhabitants are still classified as rural. On average, Latin America has the lowest rural population percentage with 24%. Asia-Pacific has 71.8%, North Africa 46%, Sub-Saharan Africa 66%.

<sup>7</sup> This can be based on figures reported to ITU, which are conservative, because these typically include only the incumbent fixed-line operator figures, and *do not* include second mobile operators, ISPs, etc.

<sup>8</sup> World Bank Discussion Paper No. 430, *Closing the Gap in Access to Rural Communications – Chile 1995-2002*, Bjorn Wellenius, February 2002, p. 18.

<sup>9</sup> *Idem*.

<sup>10</sup> It requires that somebody living close to the payphone is willing to receive incoming calls and relay messages to the called party, or that appointments when to call need to be set-up between the caller and called party.

<sup>11</sup> Grameen website (<http://www.grameen-info.org/grameen/gtelecom/index.html>).

<sup>12</sup> See for example ITU's *World Telecommunication Development Report*, 2002, Chapter 2: We found the missing link: it's mobile communications.

<sup>13</sup> A Pyramid Research report estimates that the black and used handset market in Latin America will represent 11% of all terminals sold in the market between 2002 and 2006. The upgrade to GPRS and third-generation networks in Europe and elsewhere is a factor here.

<sup>14</sup> Intelcon analysis, based on various company press releases.

<sup>15</sup> The table uses web-page published pricing data from the most inexpensive mobile operator per country. Published data from ITU's *World Telecommunication Development Report*, 2002, was used for fixed-service costs. The start-up cost for the fixed phone service comprises the full connection fee, and for mobile

service the handset plus the SIM card and activation charge where applicable. The marginal monthly recurring costs used here for fixed service include the monthly rental and just 15 minutes of outgoing local calls. Mobile service recurring costs are based on the minimum usage required for a customer to stay connected on a prepaid account (which may include some calls) plus 15 mobile-to-mobile call minutes to reach a comparable volume of usage. Costs for Brazil and Argentina are based on available data for second-hand handsets.

<sup>16</sup> The conceptual framework of the two gaps is developed in the World Bank Discussion Paper No. 432, *Telecommunications and Information Services for the Poor: Toward a Strategy for Universal Access*, Juan Navas-Sabater, Andrew Dymond, Niina Juntunen, 2002.

<sup>17</sup> The "smart subsidy" or output-based assistance (OBA) concept is an initial subsidy (usually given on a once-only basis) that is designed to be result-oriented, does not distort the market, and encourages cost minimization and growth of the market. It helps to "kick start" a project or service with the objective of ultimately seeing the programme to be commercially viable whereas, without the subsidy, investors might otherwise have been reluctant to invest.

<sup>18</sup> World Bank Discussion Paper 432, *Telecommunications and Information Services for the Poor: Toward a Strategy for Universal Access*, by J. Navas-Sabater, A. Dymond, N. Juntunen, 2002.

<sup>19</sup> The EU "Regulatory Framework for electronic communications infrastructure and associated services" is to be implemented by July 2003. It consists of five Directives: Framework Directive, Access and Interconnection Directive, Authorization Directive, Universal Service Directive and Data Protection Directive.

<sup>20</sup> Communications and Multimedia Act 1998, released on 1 April, 2000 (<http://www.mcmc.gov.my/mcmc/>).

<sup>21</sup> For example, Nigeria has found that there is limited investor interest in their incumbent Nitel but much more interest in green-field mobile licences.

<sup>22</sup> Rajat Dhawan, Chris Dorian, Rajat Gupta and Sasi K. Sunkara, "Connecting the unconnected", *The McKinsey Quarterly*, No. 4, 2001 (Special edition: Emerging markets).

<sup>23</sup> Based on data obtained from mobile operators in Uganda and Nigeria.

<sup>24</sup> Historic cost differentials quoted by ITU are that rural lines are seven times costlier than urban. Many examples and graphs can be used to support a similar differential today.

<sup>25</sup> Policies and Strategies for Rural Communications in Uganda, March 2001. This Report, submitted by Intelcon to UCC, contained an extensive user baseline survey that documented, among other things, a high demand for urban-to-rural calling and willingness to pay higher on urban-to-rural calls.

<sup>26</sup> Andrew Dymond, *Asymmetric Termination Charges for Rural Areas*, prepared for the World Bank, May 2003, forthcoming publication.