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Mastering the $4 ARPU Challenge: A Tale of India and Sub-Saharan Africa

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Emerging markets have attracted significant investment from international mobile operators—and many players were rewarded with healthy growth in subscribers and revenue. Now, however, emerging markets are maturing, posing a different challenge. Average revenue per user (ARPU) levels, already low, are expected to fall significantly for three reasons:

- The next wave of customers will primarily be low income.
- Operator competition will continue to increase.
- Consumers will face higher budget constraints given the global economic contraction.

We expect ARPU to drop from $6 today to $3 by 2013 in South Asia, and from $12 to $6 in Sub-Saharan Africa. This paper delineates business priorities for telecom operators in emerging markets—with a special focus on India and sub-Saharan Africa—in their struggle to maintain profitability.

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Global Growth Hotspots

Mobile communications passed a milestone when it broke 50% household penetration globally at the end of 2007. With growth in penetration leveling off, the remaining growth will likely be found in emerging markets with high population and relatively low rates of penetration. The two regions with the lowest mobile penetration rates are South Asia and sub-Saharan Africa (Exhibit 1). Their combined 2.3 billion inhabitants represent 35% of the world's population. In 2008, India and sub-Saharan Africa accounted for 32% of all mobile subscriber net additions. For the years 2009 through 2012, they are expected to contribute 44% of total net additions.

ARPU levels in emerging markets have been dramatically decreasing because of increasing competition, price reductions, and a second wave of customer acquisition from predominantly lower-income segments (Exhibit 2).

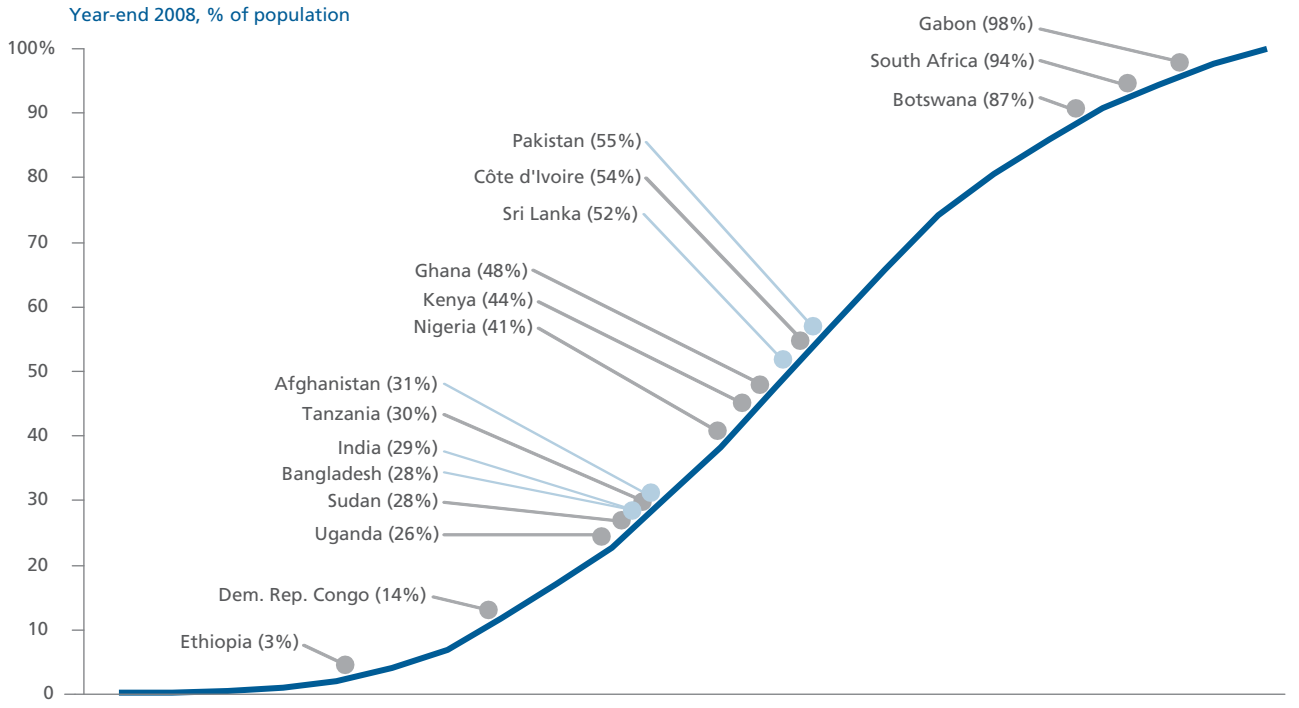
Still, the bottom has not yet been reached. Three factors will lead to a second wave of ARPU reductions in the near to mid-term:

- Customers in emerging markets are principally **prepaid customers**, who change consumption when confronted with budget constraints. In the current economic environment, a significant portion of consumption is at risk in low- to mid-value segments.

- **Price pressure** will increase as markets become more competitive. Some African markets such as Benin, Côte d'Ivoire, Democratic Republic of Congo, and Uganda have five or more licensed operators. In India, some circles already have 13 licensed operators due to the recent award of additional 2G licenses; and the planned allocation of 3G, WiMAX, and MVNO licenses will further increase competition.

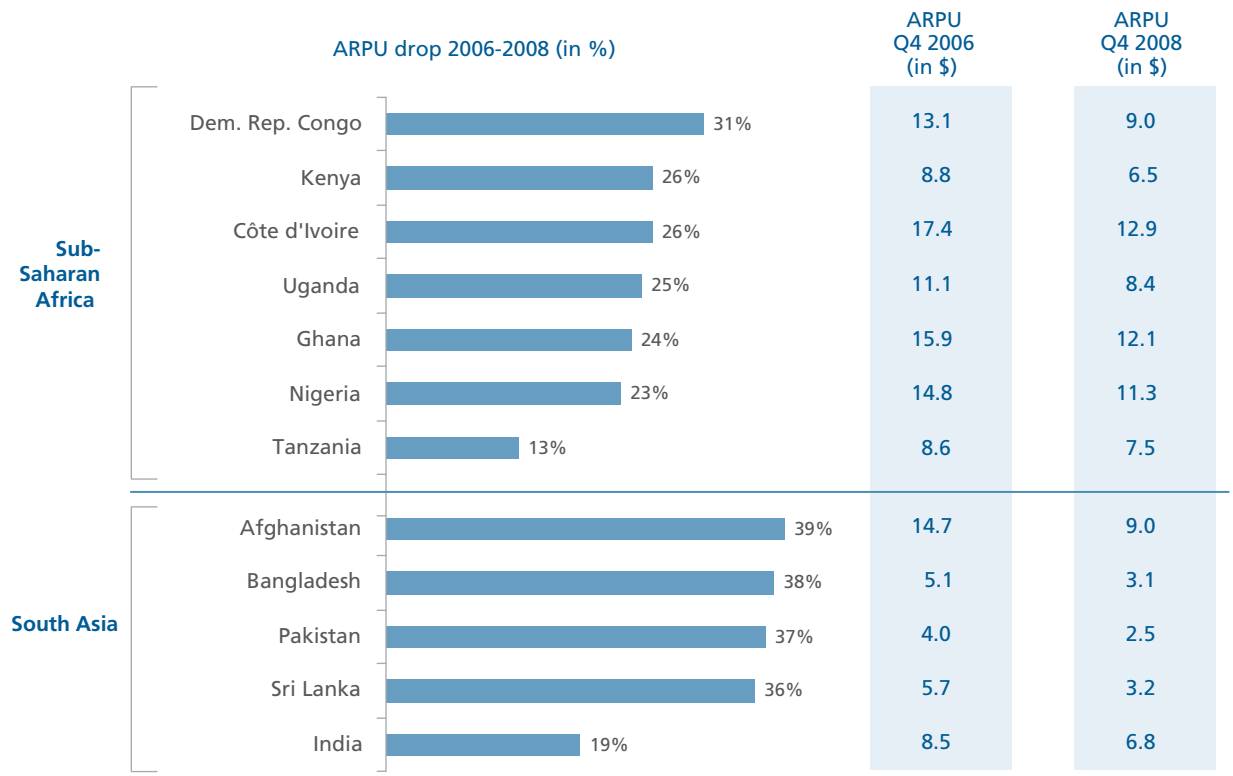
- The **customer mix** will change dramatically, tending to poorer and more rural residents. The roughly 40% of the world population that remains without phones is also the poorest, with most earning less than $2 per day. The monthly ARPU from new customers can be as low as $1 in some markets. In addition, most of the potential new customers live in rural areas, where operators face higher network and distribution costs.

Exhibit 1 **Mobile penetration in Sub-Saharan Africa and South Asia, 2008**



Source: Informa, January 2009

Exhibit 2 **ARPU evolution in Sub-Saharan Africa and South Asia, 2006-2008**



Source: ML Wireless Matrix January 2009, Pyramid Research December 2008, Oliver Wyman analysis

Oliver Wyman's forecasts show that by 2013, approximately 40% of operators' total revenues will result from low-income segments, compared to less than 20% today. As a consequence and in combination with ongoing price reductions, sub-Saharan African players will reach average ARPU levels of about $6 by 2013 (compared to $12 today), whereas players operating in India will face ARPU scenarios of $3 (compared to $7 today).

Obviously, adding more subscribers will generate further economies of scale. But scale alone will not be sufficient to sustain profitability and master the low-ARPU challenge. Beyond that, the challenges are quite different for the Indian and sub-Saharan African telecom markets.

India: Well-Positioned to Maintain Profits

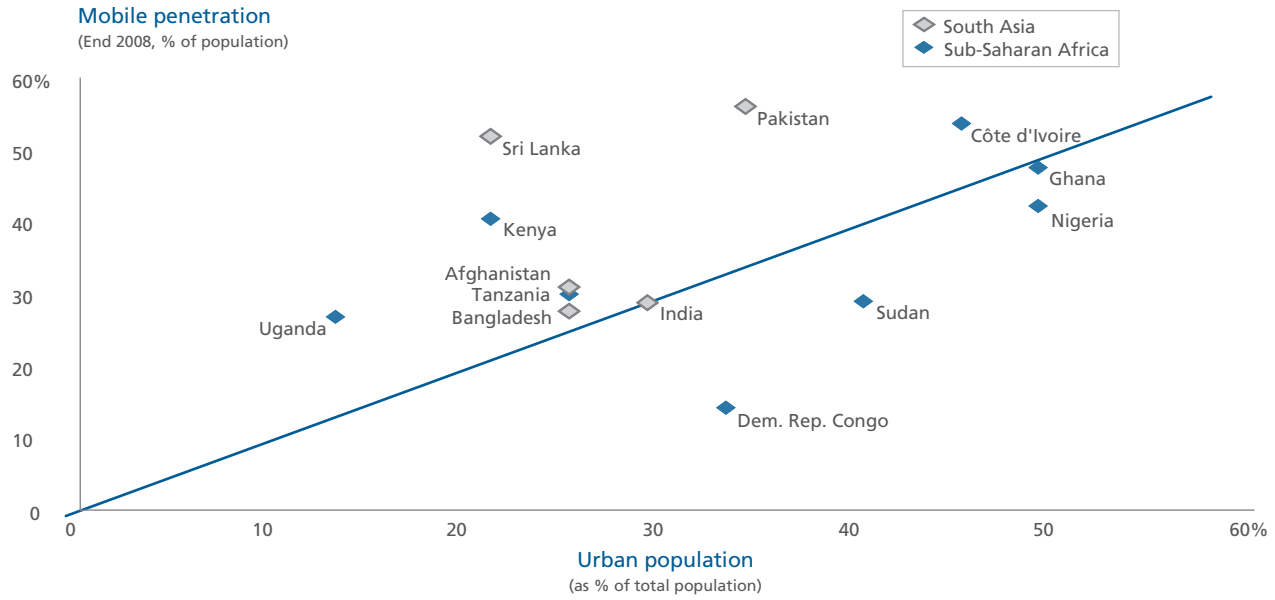
The mix of mobile subscribers in India was 71% urban versus 29% rural as of September 2008, according to the Telecom Regulatory Authority of India (TRAI). This is exactly opposite to the country's demographic composition, with 30% of Indians in cities and 70% in rural areas (Exhibit 3). To reconcile this disparity, telecom operators in India are forced to seek subscriber growth in low-income, rural areas. Yet these firms generally have mastered the basics and are well-prepared for future growth on several fronts:

- **High affordability of services.** At $0.014 per minute (as of end of 2008), Indian revenue per minute is amongst the lowest in the world. $1 buys 70-100 outgoing minutes a month, a great value proposition for Indian consumers. Pricing models require little change to further penetrate the targeted low-income segments.

- **Favorable wealth distribution.** The Gini coefficient, an indicator of wealth distribution, is 0.37 in India (0 corresponds to perfect equality and 1 corresponds to perfect inequality). India's Gini coefficient is slightly higher than the European Union's (0.30) but lower than the United States' (0.41). One consequence is that uptake has been strong in India.

- **Rapid embracing of network sharing.** India has become a leader in sharing network infrastructure. As network costs typically represent

Exhibit 3 **Mobile penetration vs urban population, 2008**



Source: Informa January 2009, CIA World Factbook, Oliver Wyman analysis

between 15% and 25% of operating expenditure (Opex) and 75% to 80% of capital expenditure (Capex), the benefits of network sharing are obvious. Indus Tower, jointly-owned by Vodafone Essar, Bharti Airtel, and Idea, has approximately 90,000 sites, making it the largest tower company worldwide. Other Indian operators have implemented similar moves to divest their passive infrastructure (the tower and its non-electronic components) into tower subsidiaries open to other operators (e.g., Reliance Infratel with about 30,000 towers) or are making deals to share infrastructure with Greenfield operators. (See the sidebar "Network Sharing in India.")

- **High economies of scale.** The Indian market is now the second largest in the world after China by subscriber count. Sheer size allows India's leading operators to generate economies of scale on Capex (e.g., Reliance has floated a tender for 75 million new GSM lines in 2007) and Opex.

- **High leverage of outsourcing and managed services.** Most Indian operators have piggy-backed on India's large outsourcing ecosystem to fully or largely outsource IT, billing, and back-office functions to external providers. Beyond savings of scale, these "asset-light" business models allow Indian operators to focus more on core functions such as marketing and service development.

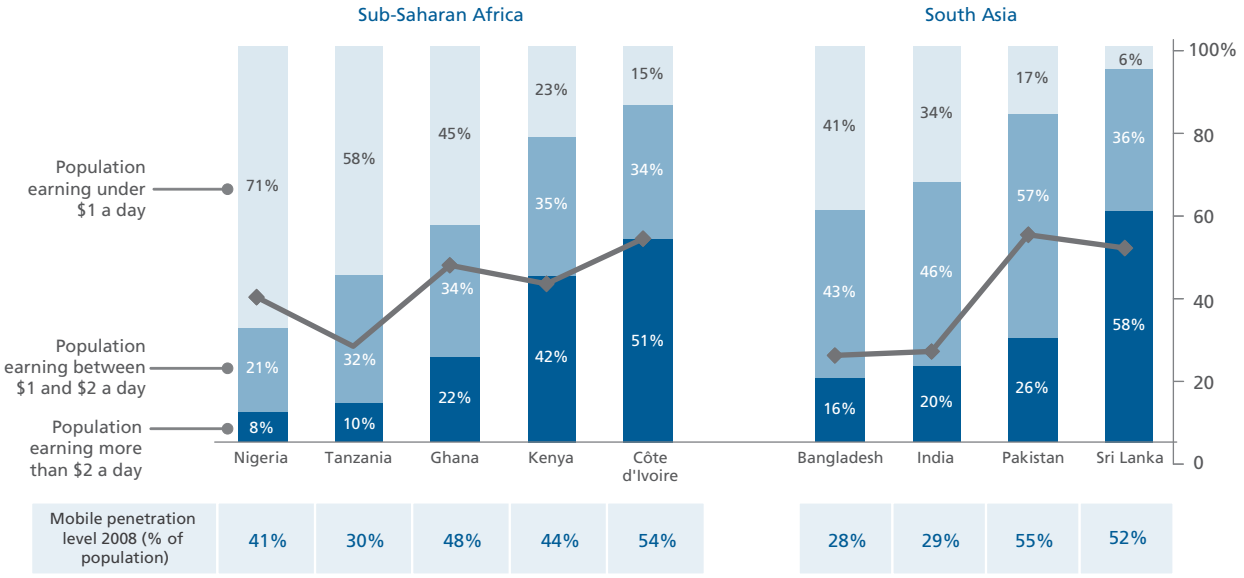
- **Increasingly favorable investment framework.** India's GDP growth has been over 9% for the past three years, and while the country is impacted by the global economic turmoil, the long-term fundamentals are still strong and attractive to telecom investors. Telecom operators will benefit from the expanding middle class and from the country's improving infrastructure. About 80% of India's 600,000 villages have electricity, and the Bharat Nirman governmental program aims to achieve 100% coverage.

Priorities for Indian Operators

With positive fundamentals, the priority for Indian telecom players is to drive efficiencies along four dimensions:

1. Accelerate network sharing and increase tenancy ratio. Despite the hype surrounding network sharing in India, the practice is still in its infancy. Operators need to accelerate passive infrastructure sharing. The key to savings is a high sharing ratio, maximizing the average number of tenants per tower. The sharing ratio is now less than 1.3, which translates into roughly 5% Capex savings, as there are costs to accommodating several tenants on one tower. Increasing the ratio to 2 would translate into a 20% savings on total Capex spend. These estimates assume a simplistic model where operators still directly fund all of their passive infrastructure

Exhibit 4 **Mobile penetration and structure of population by income segments**



Source: UN Human Development Report 2007/2008, Informa January 2009

Capex. In practice, operators also seek significant financial efficiency gains by transferring a large portion of their infrastructure assets off their balance sheets to tower subsidiaries.

Active sharing of a tower's electronic components, such as radio transmitters, is starting to take hold, although the benefits are less straightforward than with passive sharing. Operators lose the ability to differentiate on network quality and the complexity of managing agreements increases exponentially. In a best-case scenario, active sharing could generate a 10% saving on total Capex spend. National roaming agreements may prove in many cases a sound alternative to active sharing deals.

2. Reduce costs further by leveraging new technologies and services. Network costs can further be reduced by using three levers:

- Pushing services that minimize network capacity requirements, such as off-peak voice plans, mobile IM chat or SMS.
- Deploying flexible technologies that reduce transmission and switching costs. Bharti Airtel is about to become the second operator worldwide after Australian operator Telstra to roll out the "blade-cluster" Mobile Switching Center of Ericsson, a move that can save 45% in server operational expenditure.
- Harnessing alternative energy sources, such as wind, biodiesel, or solar power—or a hybrid combination. Solar panels will become increasingly affordable and batteries increasingly efficient with technological progress and manufacturing scale.

3. Extend the value proposition beyond plain voice and communication. Value-added services are increasingly important for raising ARPU, and their positive impact on customer loyalty reduces churn and lowers retention costs.

One service with great potential is mobile banking (or mobile money) within the largely "unbanked" low-income segment. Customers load money into a virtual account attached to their SIM at cash-in/cash-out centers, often housed in gas stations or other local shops, and then send money to relatives in villages or buy goods from selected merchants. The success of M-PESA ("pesa" means money in Swahili), introduced by market leader Safaricom in Kenya, is arguably the most impressive deployment to date. Adopted by more than 4 million users since its launch in March 2007 (a stellar take-up rate of 40% among the Safaricom customer base),

Network Sharing in India

Passive infrastructure typically represents 65% of the total Capex per site, and approximately 40%-50% of total Capex spend of an operator. Active infrastructure represents the remaining 35% of the total Capex per site, and approximately 20-25% of total Capex spend. The driver of savings is obviously the sharing ratio achieved.

The current sharing ratio of **passive infrastructure** in India of 1.3 provides ample room for improvement. Even in rural areas, where the business case for sharing is highest, less than 28% of the 106,000 rural base stations reported by operators as of mid-2008 were shared.

With 13 licensed operators in some circles for 2G, and further 3G, WiMAX, and MVNO licenses to be awarded, a tower-sharing ratio of 3 in India is not out of reach. The Indian telecom regulator TRAI is also strongly supporting the development of passive infrastructure sharing: Operators are only eligible to receive subsidies from the Universal Service Obligation (USO) Fund for rural sites if the tower is designed to accommodate at least 3 service providers.

However, a sharing ratio of 2 for passive infrastructure seems more reasonable in the medium term, due to several factors:

- Disparities in the spectrum bands of operators (CDMA, 900 Mhz and 1800 Mhz in GSM band, 3G) naturally limit the possibility to share sites as cell radii differ significantly.
- Most tower companies have disclosed aggressive expansion plans to build new towers, in a race to build scale. While the recent economic environment may force tower companies to scale back their ambitions, the supply of new towers is likely to prevent a sharing ratio above 2.
- Many existing sites, especially rooftops in urban areas, cannot be shared or would require substantial Capex to accommodate several tenants.

Few reliable data exist to measure the sharing ratio of **active infrastructure** in India today. In April 2008, TRAI modified operators' licenses to authorize active sharing (spectrum sharing remains prohibited). Active sharing is mostly relevant to minimize investment for deployment of new equipment, as there are limited gains to be made on existing equipment running at full capacity. Therefore, it is likely to be predominantly leveraged for rollout of future 3G services and for 2G rural sites where capacity is low. Hence, a country-wide sharing ratio of 2 seems a best case, with a 1.5 ratio more realistic in the medium term.

M-PESA has helped Safaricom increase its market share, raise monthly ARPU by $0.75 among takers, and effectively fight customer churn. Indian operators have started to investigate such services, after guidelines to regulate mobile banking were recently issued by the Reserve Bank of India.

Productivity tools that appeal to low-income, rural users, such as grain price alerts and local weather forecasts, have yet to achieve significant take-up and remain largely experimental. One key to the development of these services will be for operators to find a more balanced revenue share model that has incentives for a large ecosystem of content providers; today, operators keep the lion's share (typically around 70%) of value-added services revenues.

4. Introduce innovative retail models. Developing retail channels to penetrate the remote corners of India requires new thinking, so it can pay to leverage partnerships with players that already have an extensive rural reach. Bharti Airtel's "matchbox" distribution initiative aims at ensuring product availability wherever matchboxes are sold. An example of this strategy is the joint venture Bharti Airtel created in May 2008 with IFFCO—India's largest cooperative of farmers—to expand distribution in rural areas. The joint venture will provide prospective rural customers with a handset, SIM card, and access to relevant content, such as crop prices. Another Indian operator, Vodafone Essar, has also followed an innovative approach for the rural market—franchising marketing, logistics, and sales to local entrepreneurs.

Sub-Saharan Africa: A Business Model In Need of Change

Compared with India, sub-Saharan African operators enjoy high ARPU levels. The ARPU for eight African markets (Democratic Republic of Congo, Ghana, Cote d'Ivoire, Kenya, Nigeria, South Africa, Tanzania, and Uganda) weighted by revenue size was $11 in 2008. However, an average revenue per minute (ARPM) of approximately $0.17 leads to limited usage levels of 65 monthly minutes of use (MOU) per subscriber.

With per-minute prices roughly 12 times higher than those in India, network costs per subscriber are under control. An example: With more than 4,000 customers per site and a $16 ARPU in the first half of 2008, MTN Nigeria generates above $60,000 in monthly revenue per site—far more than the $10,000 typically generated by a site in India. This model of "high ARPM, low MOU" has proved very profitable so far: MTN Nigeria enjoyed an EBITDA of 58% in the first half of 2008, compared with Bharti Airtel's 38% EBITDA.

The African model has several barriers, starting with the conundrum that while high prices restrict growth, lower prices will cannibalize revenues from existing customers:

- **Growth is only possible by lowering prices.** High prices restrict strong penetration growth in the low-income segment. A customer with a budget of $1-2 per month for telecom services will only be able to make 6-12 minutes of outbound calls per month. Such low usage levels will not provide incentives for poor segments in Africa to invest in a handset and SIM card. Instead, low-income customers will continue to rely on Public Calling Offices (PCOs)—street hawkers reselling minutes. PCOs leave a significant portion of the low-income revenue potential unaddressed as end users are not reachable (they do not have their own number and can only place calls at a specific time and place), which translates into a considerably lower "network effect" overall. And PCOs generate structurally low gross margin for operators, as they are pure price optimizers and need a hefty cut of operators' margin to make a living out of their middleman services.
- **Prices are bound to fall.** African countries have seen a spree of new licensees over the past two years, and hence competition intensity is expected to increase dramatically in most major markets, driving down prices per minute. One clear example of that trend is Kenya, where an ongoing price war has been triggered just before the launch of Orange, the third operator.
- **Lower prices will cannibalize current voice revenues.** As African operators have few alternatives to fuel growth other than to progressively lower voice prices, operators are bound to lose a significant portion of voice revenues generated by the high-income segment. These customers represent typically 40% of their revenue today, and are not budget-constrained, hence price elasticity is likely to be too low to prevent ARPU erosion for this segment.
- **High rates of illiteracy restrict SMS as an alternative to voice.** As pioneered in the Philippines by Smart and Globe, some Asian operators have kept the price of voice high and offer highly segmented cheap SMS to the low-income segment, requiring little incremental network Capex and Opex investment. This solution, however, depends on a high literacy rate, which does not apply to most African markets. While SMS is definitely worth investigating, it is likely attractive only for specific segments, such as students.
- **Low economies of scale in a fragmented market.** Market leaders with regional or global reach such as Zain, MTN, France Télécom, Vodafone, Etisalat or Millicom already leverage their scale to lower costs of network equipment; but few enjoy economies of scale in other cost areas. The reason is that African markets are highly fragmented—marked by small populations, political issues, language barriers, and lack of affordable cross-border connectivity. This fragmentation has made it difficult so far to leverage shared platforms between local operations.

Priorities for Sub-Saharan African Operators

To grow revenues without forsaking profits, African operators need to radically revamp their business model, focusing on four priorities:

1. Make network sharing a reality. Despite large potential cost savings, network sharing remains limited: Fewer than 2% of towers are shared. Unlike India, where the four largest operators have relatively comparable market shares and coverage, many sub-Saharan African markets have one clear market leader with significantly higher network coverage than its challengers. Thus, the business case for sharing is less straightforward than in India. By opening their network to smaller competitors, operators fear losing a major source of competitive advantage and increasing price competition as they lower their challengers' cost to serve. And with significantly higher revenue per site than in India, market leaders have been so far under less pressure to drive down network costs.

Yet network sharing is bound to become a top priority. Faced with the obligation to decrease their price per minute to fuel top-line growth, operators will no longer be in a position to "afford" relatively high per-minute operating costs. Recent moves indicate that operators may be changing their mindset about network sharing. MTN and Neotel recently signed a $200 million deal to build a jointly owned fiber backbone in South Africa.

Two factors will further push African operators towards implementing network sharing. First, the global financial crisis increases the cost of financing network expansion. Second, African regulators are increasingly favorable to network sharing. For example, while sharing of active infrastructure is still prohibited in Nigeria, the Nigerian Communications Commission has published guidelines to promote passive infrastructure. The Kenyan regulator has followed a similar approach.

2. Build intra-group scale for back-office operations. Nearly half of all sub-Saharan African operators belong to only six international operators, namely MTN (17 operations), Zain (16), France Télécom (14), Etisalat (10), Vodafone (9) and Millicom (7).

To date, these pan-African groups have captured economies of scale mostly through the low-hanging fruit of centralized purchasing. But by implementing intra-group shared services in the fields of IT, billing, customer care, network operating centers, or HR, market leaders could extract further benefits. Top operators have started to work on strategic initiatives to develop shared-services platforms, giving them a significant future cost advantage over small national operators. Shared services in IT and billing, for example, can bring savings of 25% on total IT spend, and up to 5% savings in total Capex spend.

The lack of reliable and affordable international connectivity between African countries remains the major impediment to the implementation of shared services across operations. Hence, market leaders need to take actions to develop direct interconnection between their African operations; and many are participating in or supporting the many ongoing efforts to develop undersea cables and terrestrial fiber-optic connections.

While structuring outsourcing agreements always requires great attention to details, the benefits for operators include increased scalability and flexibility, transforming fixed costs into variable costs, reduced time to market, and improved focus on the core business. To jumpstart outsourcing, one option is to actively engage in co-investment deals with major global low-cost outsourcers, such as Indian companies, to encourage them to develop their offerings across Africa. Alternatively, operators could create their own outsourcers, by carving out some functions into external entities and serving other clients to build scale.

3. Master segmentation. African operators will need to segment their value proposition to capture the low-income segment opportunity, while protecting the profits extracted from the high- and mid-income segments. A priority for operators is to further differentiate their offers in order to limit cannibalization of revenues between segments. Service levels can also be differentiated based on customer value. Some operators are also testing offers where airtime is priced as a function of the call quality, as when customers paying a premium rate have priority on a saturated network over customers paying the standard rate.

4. Implement a continuous cost-efficiency improvement cycle. African operators need to implement a comprehensive strategy to streamline costs across the board. Excellence in cost efficiency is achieved by combining small gains in multiple areas. Examples of such initiatives include:

- Benchmark frequently to identify cost gaps and best practices
- Leverage further automation and technology (e.g., electronic voucher distribution to replace physical prepaid vouchers)
- Push for simplicity by eliminating complex offers and streamlining core processes
- Manage power costs tightly (run power audits, centralize purchasing of fuel) and consider alternative energy for low long-term Opex
- Invest in (shared) backbone to lower transmission Opex.

Looking Beyond the Low-Income Segment

While the next wave of subscriber growth raises many challenges for operators in sub-Saharan Africa and South Asia, operators have the ability to sustain profitability over the coming years provided that they engage now in an overhaul of their business model. Scale will increasingly become an important piece of the game. As such, the current spree of greenfield operators in these markets is bound to be followed by consolidation.

Ultimately, operators in sub-Saharan Africa and South Asia need to look beyond the low-income segment for growth and start to plant the seeds of new revenue streams for high- and mid-income customers. Just as few executives believed a decade ago that penetration of 2G mobile voice would ever go above 2% or 3% of the population in emerging markets, it may be hard to envision a large market for mobile Internet. Indeed, the addressable market for mobile broadband is now very small. But it will eventually become affordable for more customers in sub-Saharan Africa and South Asia, as large subscriber bases in richer countries dramatically drive down the cost of network equipment and smartphones.

Success stories of 2G in emerging markets were built on the backdrop of cheap licenses and small scale initial roll-out, allowing operators to limit the upfront investment and risk. Provided that governments and regulators ensure the same combination of reasonable license cost and limited coverage obligations, the next decade may well see another mobile revolution in sub-Saharan Africa and South Asia, with operators and populations leapfrogging to 4G.

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