

# Chapter 12

## Africa Leapfrogs into the World Economy

Melissa T. Cook

African Sunrise Partners is dedicated to bringing private sector capital into Africa—for growth and profit. We provide information on business and investment opportunities and work to clarify misperceptions about the current situation in key African countries, using insights gained during regular trips to Africa. We've had many conversations with otherwise worldly and sophisticated investors, corporate executives, lawyers, and accountants who still think of Africa as a place of war, corruption, and poverty. In a rising number of African countries—home to hundreds of millions of people—the story is very different. During our visits to the continent, we see a vibrant, dynamic Africa filled with entrepreneurs building businesses. The continent is sometimes noisy and chaotic but is also very much worth a closer look for investors.

Why is Africa changing so rapidly, and why now after so many years of failed promise? We think communications and technology are playing a major role. Costs are falling while capabilities soar for information and communications technology (ICT) at the enterprise and the consumer level. Africa's tech-savvy young population is ready, willing, and able to adopt new ways of communicating and doing business. Voters with information and current news are active participants in determining the direction their country will take. This is a powerful combination for business, democracy, and broad-based economic growth.

In this chapter, we outline some of the background themes to our “Why Africa, Why Now?” story. We analyze the business and financing elements of the communications and broadband video story and provide perspective on the types of companies we believe will play a role in the industry's growth. And for the benefit of readers outside the corporate or the investment communities, we offer some thoughts on how these groups make their investment decisions and how this is relevant to the broadband video story in Africa.

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M.T. Cook (✉)

African Sunrise Partners LLC, Patterson, NY, USA

e-mail: [cook@afsun.com](mailto:cook@afsun.com)

## Why Africa, Why Now?

Africa is on the move—right now. The days of Africa being seen as the “hopeless continent” are in the past. Africa is not without its problems. However, we believe that the time is right for investors and companies to take a serious look at how they plan to invest and build a profitable, competitive business on the continent. It’s not too early—markets are already becoming well developed and long-term service relationships are forming, while buyer preferences clearly favor ultramodern technology at an accessible price point.

We see three broad growth themes in business in Africa that we believe should be top of mind for the management teams and directors of international companies—and for their shareholders: Governance is improving, money is pouring into infrastructure, and the emerging middle class is quickly developing a taste for branded goods and quality services.

- *Improving governance: universal and open access to information and ideas is essential to this story.* Risk goes down when countries run free and fair elections between viable political challengers. Each time an election yields a peaceful handover of power from one political leader to another, it raises the odds that the next election on the continent will proceed peacefully and represent the will of the people. During the past few years, we have seen elections yield a peaceful political transition—even if in a messy or an imperfect fashion—in countries including Zambia, Senegal, Kenya, Ghana, and Nigeria. New constitutions and more consistent enforcement of existing laws can produce greater certainty and stability in a country’s economy, which comes as welcome news to investors.
- *Urbanization and rise of a middle class:* Africa is urbanizing rapidly. People move into cities in search of better jobs, services, and access to education. Cities expand to incorporate rural or suburban areas. Urban dwellers generally have higher incomes, and they spend more on goods and services. Consumer spending is on the rise. Even the poorest shoppers have money to spend. Thriving informal economies provide spending power not captured in official statistics—creating underappreciated levels of demand. Formal markets cater to middle-class shoppers who flock to gleaming new malls offering a dizzying array of choices. Information and communication services are a vital part of the budgets of urban consumers.
- *Infrastructure to enable industrialization:* The Chinese proverb holds true in Africa: “To get rich, first build a road.” All over Africa, new roads are being paved. Rail lines are being rebuilt, airports are being expanded, and ports are being upgraded. Electricity is still too scarce and too expensive, but there are encouraging signs as key countries privatize the sector in order to attract investment in new capacity. Alternative energy installations are becoming viable thanks to shrinking costs for solar and other technologies. Expanded infrastructure enables industrialization and supports economic growth. China’s engagement has yielded the rapid rollout of new infrastructure capacity. Supply begets

demand—more telecom, road, rail, power, airport, and port capacity is a clear stimulus to economic growth and demand.

## **Broadband Video: An Enabler and a Beneficiary of These Trends**

ICT is an essential element of our positive case for Africa. Counterintuitive though it may sound, Africa is well positioned today to benefit from new technology specifically because the continent lacks legacy systems and entrenched, inflexible competitors and regulatory infrastructure.

Africa has a shortage of bricks-and-mortar banking and retail outlets, libraries, efficient government offices, educational and healthcare facilities, and agricultural extension offices. It's expensive to manage a business, run a household, or provide government services without the benefit of a developed information, transportation, and financial services infrastructure. Shopping, registering a car, transferring money, and paying bills can be time consuming and usually involve carrying large amounts of cash. Commercial and agricultural markets are inefficient because buyers and sellers don't have access to current market-based prices.

Technology is addressing many of these challenges. Mobile money, videoconferencing or data transmission for healthcare, and online education all are viable new businesses. We see a tremendous amount of innovation happening in Africa—in ICT and other sectors. Local entrepreneurs are designing solutions to local problems. They are supported in many areas by major multinationals. An IBM, Google, or Microsoft venture, R&D effort, or data center may directly or indirectly underpin the development of local developers, service providers, and businesses. Multinationals train and develop experts who often go on to build their own local ventures, creating valuable local jobs and developing new intellectual property that will be used in Africa and throughout the world.

## **Communications Investment in Africa Is Nothing New**

The African communications sector has already received investment that caused nothing short of a revolution. The sector's influence on economic performance has already been significant. Investments made and services developed during the past decade are the foundation for the next generation of communication advances on the continent.

What were the catalysts? What was the result? Consider:

- *Vision:* In the late 1990s, Sudanese entrepreneur Mo Ibrahim saw the demand for mobile phone services that others overlooked because of their reliance on statistical evidence rather than actual market knowledge. Rather than seeing the low levels of fixed-line penetration as indicative of poor demand, Ibrahim

believed that properly priced mobile services would be taken up by millions upon tens of millions of consumers. His flexible, affordable mobile model gained near-universal acceptance, created an entirely new industry in Africa, and gave others confidence to invest in mass-market mobile services that have been wildly successful.

- *Competition*: Enlightened regulators in key markets recognized that open and free competition amongst private sector mobile operators would drive prices down and accessibility of mobile services up. Technology suppliers developed the capability to offer prepaid airtime, sold by vendors in informal and formal markets. Africa benefited from the entry of aggressive Chinese equipment manufacturers whose technology was priced below that of global competitors but offered sufficient functionality to meet Africa's needs.
- *Consumer demand*: Africans quickly demonstrated an insatiable appetite for communications. Our favorite illustration of this is a billboard we saw in Lagos, which freely acknowledges the propensity of Africans to talk, talk, talk—and offers them airtime at a low, low price (Figs. 12.1 and 12.2). Figure 12.3 illustrates the rapid expansion in mobile penetration in major countries over the past 10 years, while Fig. 12.4 illustrates the total mobile phone users on the continent. We often ask Africans about consumer spending priorities, with the question, “What would you do with an extra 100 shillings, 5 cedi, or 50 naira?” The answer is invariably “Buy airtime.” Affordable, ubiquitous mobile phone service allows people to stay connected, learn about employment opportunities, and share information.
- *Declining prices*: Ultra-cheap “feature phones” (e.g., basic mobile phones with no smartphone features) and inexpensive packs offering prepaid voice minutes allow entry-level consumers to get connected. In the most competitive markets, operators have cut airtime tariffs aggressively to stimulate demand. Consistent with the historical pattern in other markets, average revenue per user declines as penetration extends to include lower intensity users. Demand for minutes is not as elastic as in developed markets, primarily because of low consumer spending power in large segments of the market. Sometimes, price cuts just mean lower revenue, not greater volume.
- *Expanding services*: In the longer term, we see data and other advanced services as key drivers of the sector's revenue growth. Figure 12.5 illustrates Cisco's estimates for global data growth—and Africa's rising contribution to the total. For mobile operators, rising demand for data delivery offers an opportunity for improved revenue and margin performance.
- *Favorable demographics*: Demographics work in Africa's favor: Younger Africans are eager to adopt new technologies. Some of the most exciting and dynamic people we've met on the continent are young graduates who see the opportunity to solve problems, make money, and blaze a new path in the ICT sector. Social media is thriving across the continent.
- *Scale/innovation*: A multi-hundred-million-strong user base offers scale to justify the development of new communication-related services. Entrepreneurs are creating locally designed solutions to meet African needs. The most visible is



Fig. 12.1 Talk is cheap. Source: African Sunrise Partners LLC



Fig. 12.2 Prepaid airtime cards. Source: African Sunrise Partners LLC

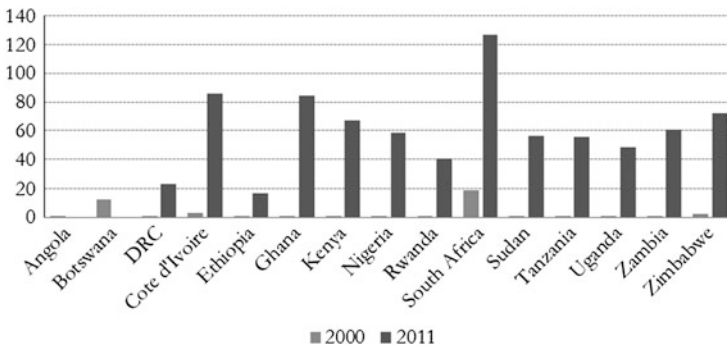
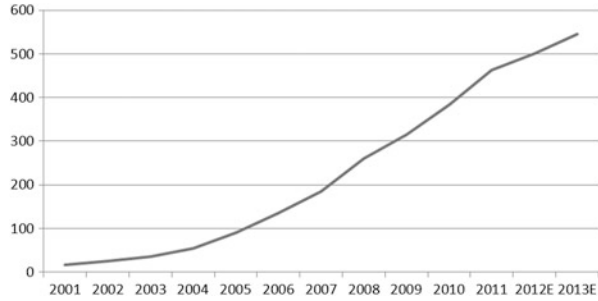
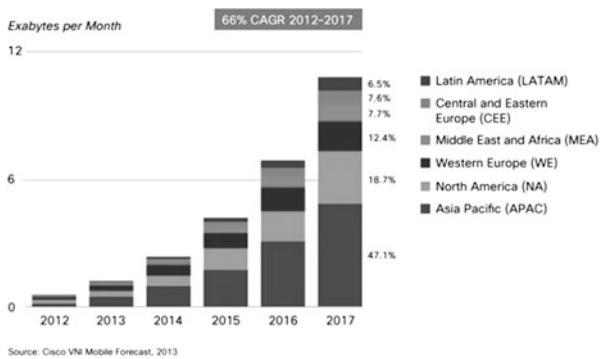


Fig. 12.3 Mobile penetration rate—2000 vs. 2011 (ITU). Source: International Telecommunication Union (ITU)

**Fig. 12.4** Mobile cellular subscribers in Africa, in millions (ITU). *Source:* International Telecommunication Union (ITU)



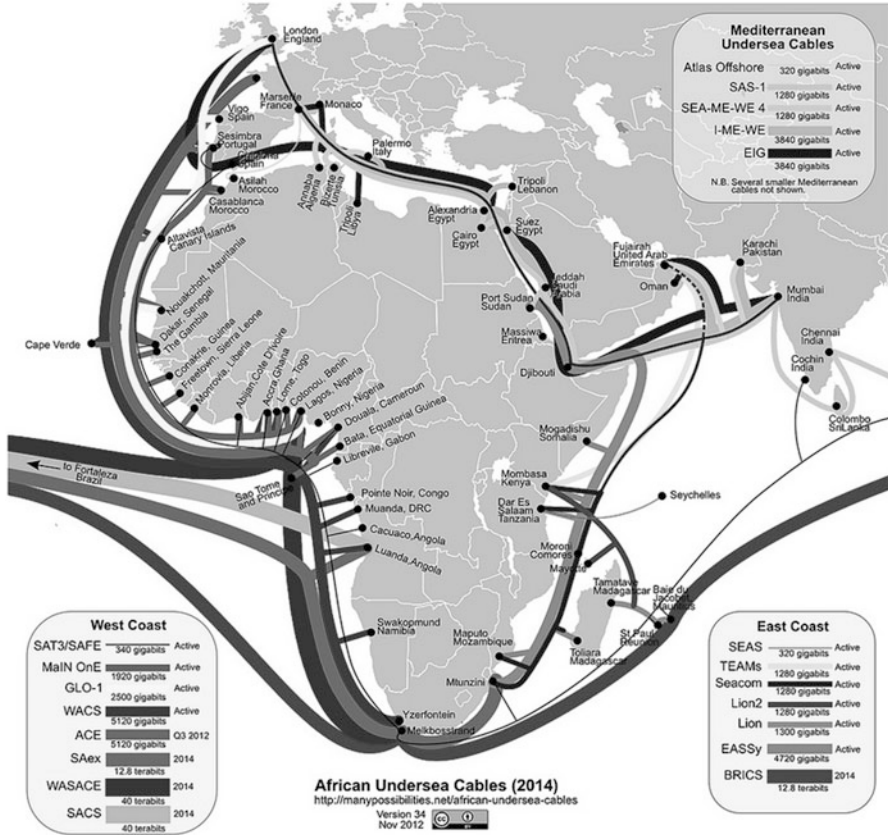
**Fig. 12.5** Projected mobile data traffic growth (Cisco). *Source:* Cisco (*Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2010–2015, here*)



Kenya’s mobile money platform M-Pesa, which has brought millions of new customers into the financial system. It has facilitated transactions of all sizes between people throughout the country, boosting the velocity of money and adding measurably to Kenya’s economic growth. Technology used in the Ethiopia Commodities Exchange allows rural farmers to access larger markets and benefit from price transparency. Kenya’s iCow brings text-based information to dairy farmers, helping them optimize milk yields and boost income.

## Networks to Support Soaring Demand

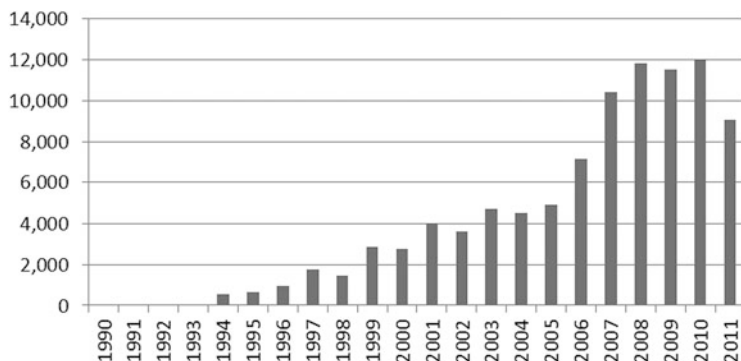
Africa is no longer a continent separated from major economies by silence. Subsea cables offering vastly expanded data capacity landed in key markets including Kenya, South Africa, and West Africa during the past several years. Africa is fully connected to the world with bandwidth transmitting ever-expanding quantities of data. The carrying capacity of these cables has risen exponentially based on rapid advances in the electronics controlling data running through the system. The map in Fig. 12.6 highlights the subsea cable capacity already in use and slated to come online over the next several years. Sub-Saharan Africa has already seen soaring private sector infrastructure investment in communication assets (Fig. 12.7).



**Fig. 12.6** Subsea cables bring data transmission capacity to Africa (Many Possibilities). *Source:* Printed courtesy of Steve Song, Many Possibilities ([www.manypossibilities.net](http://www.manypossibilities.net)). License: Creative Commons Attribution CC BY 3.0

Bringing data to Africa isn't enough, however. Companies are now tackling bottlenecks in the system from the fiber landing sites through to the last mile into customer premises. Data must be distributed via wireless or fixed-line networks. Bandwidth is being pushed further out into the network, via metropolitan fiber rings, long-haul fiber runs, mobile, microwave, or satellite channels. One illustration: Liquid Telecom is building terrestrial fiber networks in southern and eastern Africa (Fig. 12.8), sometimes in cooperation with electric utilities for broadband over power lines. This process isn't always smooth. Service disruptions are common across the continent because of "backhoe fade" (construction-related fiber cuts) or cable and equipment theft.

Companies are putting up new microwave transmission capacity in areas where fiber links are too expensive. Operators are investing in advanced systems for efficient mobile spectrum use or new towers and building local last-mile fiber or Wi-Fi networks in urban areas. Urban airwaves are clogged with heavy voice and



**Fig. 12.7** Total private investment in sub-Saharan Africa telecom (US\$, mn; World Bank). *Source:* 2011. *PPI Database*. ©World Bank. License: Creative Commons Attribution CC BY 3.0

data traffic. Governments need to get to work quickly on allocating new spectrum and allowing competition to invest and flourish where more capacity is needed.

## Technology Innovation Happening at the Right Time

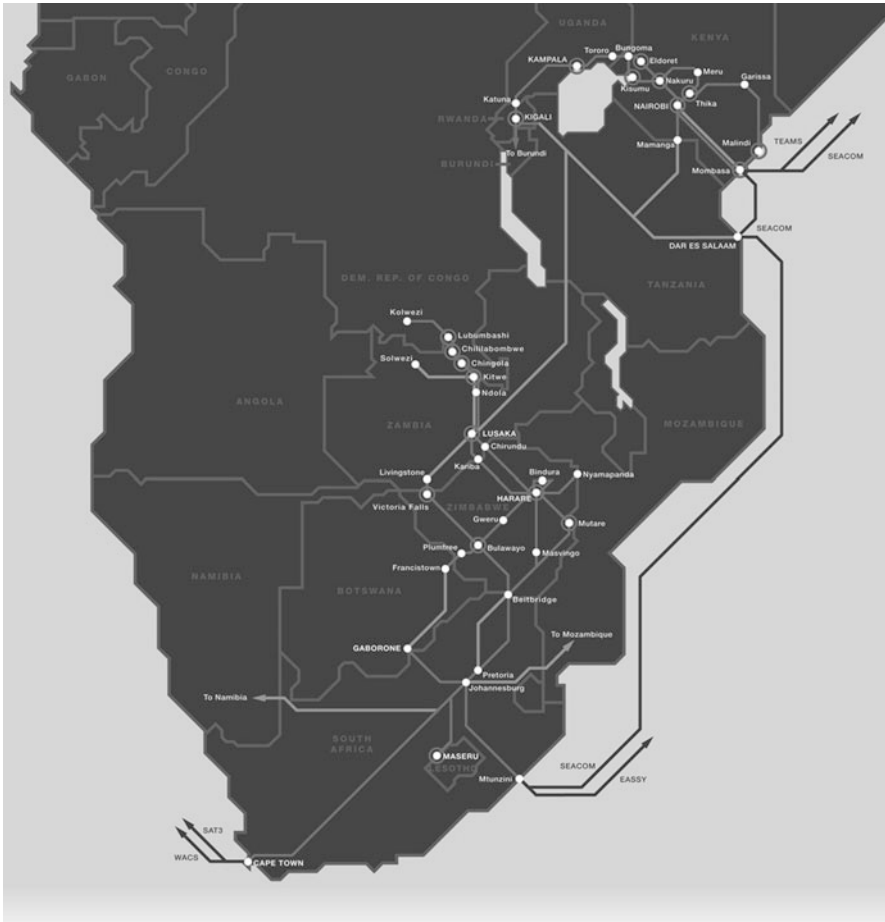
Africa is benefiting from an innovation “race to the bottom” in the mobile handset space. Encouraged by soaring demand from developing-market consumers, Asian electronic firms are developing equipment offering ever more features at ever-lower prices.

While the latest iPhone gets all the attention in developed markets, in Africa the Holy Grail is the sub-\$50 smartphone. This is the price at which mass adoption is expected to happen, pushing mobile Internet usage dramatically higher. Samsung, Huawei, HTC, and ZTE are some bold-faced names in this space. Microsoft’s recently announced venture with Huawei for Windows-enabled, low-priced phones is a further illustration of this story. Household computer ownership is quite low, so we expect many Africans to use mobile devices to access data and video services. Of course, deployment of smartphones will put even greater pressure on urban airwaves, underpinning the demand for mobile network equipment.

Cloud computing is becoming the norm for global business. Removing the need for bulky, expensive, power-hungry, and maintenance-intensive in-house enterprise hardware allows African entrepreneurs to access and afford the services they need to run their companies. Cheaper and more accessible centralized computing capacity will allow developers to build transformative services for government, education, healthcare, financial services, and industrial users.

Data centers are in short supply in Africa so far because of costly land, connectivity, and power requirements. However, electricity generation capacity is improving and will eventually lead to reduced costs for power users throughout the industry. Declining costs for distributed (off-grid) or alternative energy sources





**Fig. 12.8** Liquid Telecom is building terrestrial fiber networks in southern Africa (Liquid Telecom). *Source:* Liquid Telecom

and deployment of long-haul fiber capacity will reduce barriers to entry here. Suppliers of servers, data storage devices, routers, and electrical and cooling equipment need to focus now on addressing the requirements of African data center operators. We have seen complaints about designs leading to unnecessarily high power consumption in developed-world data centers, where power generation capacity is plentiful and conservation isn't a high priority. In Africa, data center operators will demand the most modern, efficient technology at an accessible price point.

## Bringing Broadband Ideas to Reality: Technology and Economics

Investors thinking about how to invest in Africa's burgeoning communications sector will find activity in a variety of areas. But the pattern of development and the list of suppliers may look very different than in developed markets. Innovation is originating from new and different places: Developing-market entrepreneurs are building systems, equipment, and solutions that are appropriate for emerging markets. Competition from Chinese, Korean, and Indian equipment suppliers is intense. Firms based in developing markets often operate from a lower cost structure than firms selling to richer customers. Developing-market firms may have a different design sensibility than entrenched global competitors. These vendors also have a laser-like focus on the price/performance balance of their products. Across industrial and technology sectors ranging from construction machinery to ultrasound devices to consumer electronics, we see products that are engineered to deliver adequate performance at price levels acceptable to emerging-market buyers, rather than being engineered to perfection and at a price level to match. Tables 12.1 and 12.2 illustrate some of the companies and segments involved.

Where is investment money being spent? Here are a few examples:

- *Laying the pipes*: Construction firms, fiber and cable manufacturers, engineers, and network architects are already at work. Since fiber cuts are common, networks must be engineered with redundant transmission routes.
- *Putting up the towers*: Mobile phone towers are pushing out into very rural areas. Desperately overloaded urban systems require more towers, more fiber, and more effective spectrum allocation. Towers require primary and backup power, involving grid power (where this is available) and diesel generators (protected by a strong security system and a full-time security guard). Innovative systems to use alternative energy and hybrid power generation are likely to find strong demand as prices decline. Examples of technology being developed to improve the performance of towers include colocation of transmission equipment from more operators, stronger signal broadcast with reduced power consumption, and improved quality of signal transmission for equipment sited lower on a tower.
- *Lighting the fiber*: Laying fiber is one part of the story, and lighting it is another. Capacity doesn't exist until electronics—and the power and software to run the network and route the data—are in place.
- *Installing customer premise equipment, software, and services*: Asian OEMs including Lenovo and Samsung are very active and visible in Africa. IBM HP, Microsoft, Cisco, SAP, and Oracle are pushing for a larger share of the enterprise hardware, software, and services markets. Google is actively engaged in developing e-commerce and other solutions to African needs, many of which will have utility in other global markets.

**Table 12.1** Companies of all stripes involved in African ICT (ASP)

Company	Business activities
Access Kenya	Internet services
Alink Telecom	IP-based telecommunication solutions for Africa
AMD Global Telemedicine	Remote medicine applications
Asia Broadcast Satellite	Satellite coverage of portions of sub-Saharan Africa
AT&T	Global telecom services
Bharti Airtel	Mobile communication services
Businesscom Networks	Satellite Internet solutions covering sub-Saharan Africa
Canal + (Vivendi)	Satellite-based programming covering sub-Saharan Africa
Cisco	Networking and telecom equipment
DUMA	Mobile-based job-matching service
Econet	Telecommunication services
Econet Wireless	Mobile communication services
Emerson	Network power, data center equipment, other electrical equipment
Ericsson	Telecom and data networking equipment
Essar Telecom	Mobile communication services
Eutelsat Communications	Satellite coverage of portions of sub-Saharan Africa
Google	Internet services
Helios Towers	Mobile tower operator
Hewlett-Packard	Hardware, software, and services
Huawei	Telecom and data networking equipment
IHS	Mobile tower operator
IBM	Hardware, software, and services
iCow	SMS-based information service for dairy farmers
Jamii Telecoms Ltd.	Network infrastructure services
Kenya Data Networks	Internet and network services
Lamit Company	Satellite coverage of portions of sub-Saharan Africa
Lenovo	Computer technology for developing-market users
Lion	Subsea cable operator
Liquid Telecom	Terrestrial fiber networks and services
Main One	Subsea cable operator
Microsoft	Software and services
Mobitel	Internet services
Motorola	Hardware and services
Hitachi Data Systems	Storage and cloud computing equipment
MTN	Mobile communication services
Nokia	Telecom and data networking equipment
Oracle	Software and services
Orange	Mobile communication services
Safaricom	Mobile communication services
Samsung Electronics	Hardware provider
SAP	Software and services
SasaAfrica	E-commerce platform connecting users via mobile phone
Seacom	Subsea cable operator
SES	Satellite coverage of portions of sub-Saharan Africa
Speedcast	Satellite communication services
Suburban Telecom	Terrestrial fiber network operator

(continued)

**Table 12.1** (continued)

Company	Business activities
TEAMs	Subsea cable operator
Transition Networks Inc.	Hardware manufacturing
Vizada	Satellite and value-added communication services
Vodacom	Mobile communication services
WIOCC/Eassy	Subsea cable and network services
Zain	Mobile communication services
ZTE	Telecom and data networking equipment

Source: African Sunrise Partners LLC

- *Keeping it local*: Bold-faced names of multinational companies tell only part of the story, however. Africa has a vibrant ecosystem in IT innovation. Governments including Kenya and Nigeria are investing to facilitate collaboration and support the development of new services; but in our view the most exciting action is taking place in the private sector, often at the micro-enterprise level.

What's going to be pushed through all of these networks? Who will pay?

*This entire story has a bit of a chicken-and-egg aspect to it.* Network construction must be funded by revenues from users. Financial forecasting of revenues requires an understanding of how people will use networks, what they will pay for, and how all of this investment will generate returns. The runaway success of Mo Ibrahim's mobile business—at a time when there was no statistical evidence that people would pay for communication services—illustrates the challenge here. On one hand, content developers and network operators must believe that there will be demand for more content than is being consumed today. On the other hand, you can't build a bankable business plan on hope and dreams alone. Our optimism is based on the evidence that broadband networks can deliver far more than just entertainment and information. Innovative entrepreneurs can use available bandwidth to transform how people interact with business, government, healthcare system, and schools.

Here is a sampling of content development initiatives we've seen:

- *Mobile banking and financial services*: Kenya's M-Pesa is the best known, but mobile money is an idea whose time has come continent-wide. From receipt of remittances to cross-border payment of business accounts to efficient payment of school fees and utility bills, mobile money is everywhere. As middle-class Africans start buying insurance, accessing lines of credit, and opening retirement savings accounts, this growth will not be hampered by the limited bricks-and-mortar banking presence across the continent.
- *E-government*: From voter registration, property title transfer, and digital access to court records to a public means of tracking how tax money is being spent, investments in e-government are likely to yield quick returns to citizens.
- *Healthcare*: Examples here include transmission of digital diagnostic test results to a remote physician and videoconferencing between patients in rural clinics and urban medical specialists.

**Table 12.2** Many layers of investment required to deliver broadband video (ASP)

Market segment	Selected market participants
Submarine cable systems	<ul style="list-style-type: none"> <li>• EASSy</li> <li>• MainOne</li> <li>• Seacom</li> <li>• TEAMs</li> <li>• WACS</li> <li>• WASACE</li> <li>• Corning</li> </ul>
Equipment manufacturers	<ul style="list-style-type: none"> <li>• Ericsson</li> <li>• Cisco</li> <li>• Huawei</li> <li>• ZTE</li> </ul>
Data center technology and services	<ul style="list-style-type: none"> <li>• Google</li> <li>• Eaton</li> <li>• Emerson</li> <li>• IBM</li> <li>• Microsoft</li> </ul>
Consumer equipment	<ul style="list-style-type: none"> <li>• Motorola</li> <li>• Nokia</li> <li>• Samsung</li> <li>• HTC</li> <li>• Lenovo</li> </ul>
Mobile tower operators	<ul style="list-style-type: none"> <li>• American Towers</li> <li>• Helios</li> <li>• IHS</li> </ul>
Broadband along power lines	<ul style="list-style-type: none"> <li>• Copperbelt Energy</li> <li>• Liquid Telecom</li> </ul>
Power	<ul style="list-style-type: none"> <li>• Diesel generators (e.g., Cummins, Caterpillar)</li> <li>• Solar</li> <li>• Hybrid alternatives</li> </ul>
Network operators	<ul style="list-style-type: none"> <li>• Liquid Telecom</li> <li>• Airtel</li> <li>• MTN</li> <li>• AT&amp;T</li> <li>• Incumbent wireline providers</li> </ul>
Financial institutions and payment platforms	<ul style="list-style-type: none"> <li>• M-Pesa</li> <li>• Airtel Money</li> <li>• Google's Beba NFC payment card</li> <li>• Virtual Terminal Networks</li> </ul>
Innovators, disruptors, and content providers	<ul style="list-style-type: none"> <li>• iCow</li> <li>• iSchool.zm</li> <li>• Silicon Savannah</li> <li>• Nollywood</li> <li>• Google</li> <li>• Paga</li> <li>• m-Health, e-Learning</li> </ul>

*Source:* African Sunrise Partners LLC

- *Education*: Access to remote libraries, data, and information is being enabled by technology. Students living far from cities can now access specialist educators and higher level teachers via video links.
- *Commerce*: Africa's millions of small-scale entrepreneurs are able to tap into far-flung markets, sources of materials, pricing data, and financial support.
- *Local news and content*: Given the extreme fragmentation of African markets, this content needs to be of low cost and high impact. However, it can also bring people together to share how problems were solved in a neighboring country, how societies are evolving, and how African regions can unite to create a stronger economy.
- *Entertainment*: Nigeria's Nollywood is already world famous for its film production, which is the classic example of pricing a product to meet the needs of its buyers. Movie "theaters" in Africa today can be as simple as a room with chairs and a white wall; when the market will bear higher prices, they can be as plush and high-tech as people desire.

## What's the Financial Angle?

How can African governments attract investor funding? They must start by involving the private sector as a partner in designing a stable and predictable regulatory framework. This will allow companies and financiers to assess markets, develop viable long-term business plans, allocate capital, and build successful business models.

Government policymakers need to understand how corporate executives think. Corporate managements are stewards of shareholder capital, and they answer to a variety of stakeholders. The chief executive officer, chief financial officer, board of directors, strategic planning department, and operating management all are focused on allocating capital in a way that generates returns on capital in excess of the cost of capital. If this math doesn't work, an investment or an acquisition will destroy value. Destruction of value is anathema to the purpose at the heart of even the most altruistic, socially minded companies—i.e., to create value for stakeholders. No corporation lives with a value-corroding element in its midst for very long—unless deemed warranted by a solid business case anchored to visible, quantifiable future growth potential. Firms with a public listing on a US stock exchange also face relentless pressure from investors to deliver consistent quarterly earning growth, a goal that often is incompatible with long-term business development in markets of uncertain size. Asian firms tend to think in terms of decades, not quarters, and they often take a longer term, more strategic approach to capital allocation.

We see rising demand for investments in Africa from institutional investors. These organizations are responsible for delivering returns to their clients. These clients include college endowments, pension plans, and other savings vehicles that must yield a return to their owners. Institutional investors plan their asset allocation and investment programs to deliver a particular combination of risk-adjusted returns. Africa can provide an important element of diversification and growth

potential to a portfolio, when viewed in the context of the balance of that investor's holdings.

Investing in Africa poses opportunities and challenges for companies, investors, and entrepreneurs:

- *Perception of challenges is often greater than the reality.* We see a general lack of awareness and poor understanding of opportunities in Africa. Global investors and corporations are held back by spotty access to information about Africa. News in mainstream developed-market outlets is often distorted, with a focus on shock value rather than balance. In this environment, risks are magnified while opportunities are underplayed. Real risks that we see include high costs because of poor infrastructure and limited human capital, realities of disease and difficult physical environments, changing regulations, and uneven application of rule of law in different countries. Corruption is a factor in Africa, but it is not unique to the continent.
- *The opportunities are compelling, in our view.* Demand exceeds supply for virtually everything. Spending power is far greater than is indicated by official statistics, which fail to capture the size of informal markets. Many items have latent demand: How can you measure electricity or cement consumption when supply isn't there? Companies often find that demand far exceeds their original estimates, forcing them to scramble to expand capacity far earlier than market data had indicated.
- *Unique time and place for entrepreneurs and vendors in the ICT sector.* We see a particularly exciting opportunity in the ICT sector. Entrants have an opportunity to start from scratch, without the need to work around shortcomings of legacy systems. Networks and systems can be designed to avoid the costly mistakes made in developed markets where architecture is now destiny. Companies can design networks with the benefit of cheaper technology, delivering increasingly robust performance. Network engineers have a far clearer idea of how voice, video, and data traffic flow than was possible in recent decades when developed markets' cable TV networks were built. Best of all, Africa's innovators are coming into their own, building solutions to their continent's problems and positively affecting how Africa develops in coming decades. This is the dynamic marketplace, rich with potential, that today's new entrants into African ICT markets step into.