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Innovation in Africa: A View from the Peaks and Hilltops of a Spiky Continent

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Introduction

In a widely read 2005 article in the *Atlantic Monthly*, author Richard Florida argued that with respect to innovation, the world is anything but flat. Given the way that creative talent, technical expertise, and financial capital tend to cluster in a handful of hubs or “peaks” around the world – places such as New York, San Francisco, London, Berlin, and Tokyo – the world’s innovation topography is best described as “spiky” (Florida, 2005). Although Africa, to borrow Florida’s metaphor, has few innovation peaks of global significance and lots of valleys (and indeed, plenty of chasms), the continent does contain a growing number of hills, wherein entrepreneurs are profiting from latecomer advantages in technology to design new products, reengineer old ones, and launch bold new business models. African entrepreneurs and corporations have made particular inroads in sectors such as telecommunications and financial services, where firms like Safaricom and MTN Group are world leaders in mobile money. But they have also achieved success in manufacturing, consumer goods, and agriculture (Juma, 2011; Ware, 2013).

And while Africa’s private sector is the key driver of innovation on the continent, a host of other actors, including venture capitalists, tech accelerators, private equity firms, multinational enterprises (MNEs), and nonprofit organizations, are playing a supporting role by lending their skills, know-how, and capital to unlock new business opportunities on the continent. Meanwhile, national and local policy makers are undertaking far-reaching reforms to improve the business climate and make government more efficient and transparent. This chapter takes stock of these developments, particularly within sub-Saharan Africa, while identifying key obstacles to the continent’s continuing innovation-led economic expansion.

Africa's innovation landscape

For many in the West, the word "Africa" conjures up images of poverty, despotism, war, famine, and disease. On the economic front, the continent is often portrayed as a basket case, prone to graft and mismanagement and kept afloat only by foreign loans and humanitarian aid. But this picture – which was never fully accurate – is quickly becoming anachronistic. Sweeping economic and political reforms initiated during the 1990s and 2000s are transforming the business environment of the continent in a positive way, while attracting foreign direct investment and spurring economic growth (World Bank, 2014a). The improved business environment has also proven a fertile ground for innovation. Much of this innovation has involved African firms devising low-cost, homegrown solutions to local problems. This bottom-up approach to innovation has been variously termed "frugal innovation" (*The Economist*, 2010a) and "juggad" (Radjou et al., 2012). Examples of this phenomenon include the Mi-Fone line of inexpensive mobile phones launched in 2008 by a Ugandan entrepreneur and former Motorola executive (Nsehe, 2013), and the Hippo Water Roller, a lightweight yet durable, high-capacity water transportation drum created by two South African entrepreneurs that can be rolled on the ground rather than hoisted on heads or shoulders, thereby preventing spinal injuries (Holland et al., 2012).

One indicator of Africa's growing innovation prowess is the continent's steadily improving performance in the Global Innovation Index (GII), which annually ranks over 140 nations according to their technological capabilities, capital resources, and human competencies. In 2014, Rwanda, Gambia, Mozambique, Burkina Faso, and Malawi joined the ranks of "innovation learners" alongside Kenya, Uganda, and Senegal. These are economies that performed at least 10 percent higher on the index than their peers with similar GDPs. At present, nearly half of all the nations designated as innovation learners emanate from sub-Saharan Africa (Global Innovation Index, 2014).

What explains the surge of innovation in the world's poorest, least developed, and most politically unstable continent? One catalyst has been forward-looking government policy. Leaders like Rwandan President Paul Kagame and Babatunde Fashola, Governor of Lagos State, Nigeria, have championed innovation at the national and state levels, seeking ideas and inspiration from places like Singapore and Dubai (Chu, 2009). Other leaders, like Kenya's President Mwai Kibaki (2002–2013), have tapped technocrats to spearhead crucial economic development projects, including the laying of undersea cables and 4G networks, the creation of innovation hubs, and even the building of an entire new city dedicated to high-tech business and research, dubbed the "Silicon Savannah."

Rapid population growth has been a second catalyst for innovation. Between 1985 and 2014, Africa's population doubled from 500 million to 1 billion. It is projected to double again between 2014 and 2040 (UNDESA, 2013). At present, more than 200 million Africans are between the ages of 15 and 24, making Africa the youngest continent in the world (UN Habitat, 2014). The youth bulge will likely generate an economic dividend, since economies tend to grow when there is a high ratio of working-age adults to dependants (Devarajan and Fengler, 2013). And given the way that young Africans are using their technological skills to spearhead innovations in education, health care, and agriculture, there may be an innovation bonus too (UNESCO, 2014).

Urbanization has been a third catalyst for innovation. Between 1980 and 2010, the number of Africans living in cities jumped from just over one quarter to 40 percent of the population, and the number of city dwellers is expected to rise to nearly 50 percent by 2030 (UN Habitat, 2014). Already, Africa has 52 cities with at least 1 million residents – the same number as in Europe (Berman, 2013). This mass migration from rural villages to megacities like Lagos, Kinshasa, and Johannesburg has motivated enterprising Africans to come up with creative solutions to satisfy basic needs, such as paying for goods and services, navigating congested highways, finding jobs, and gaining access to health care, clean water, electricity, and education. Meanwhile, the growth of Africa's urban middle class, which now represents about 375 million people, has attracted the interest of Western consumer goods firms seeking to capitalize on the growing demand for everything from groceries to cosmetics (Ware, 2013; Deloitte, 2014).

A fourth innovation catalyst has been the mobile telecommunications revolution. At the dawn of the millennium, relatively few Africans had mobile telephone subscriptions, so making or receiving a telephone call required using the notoriously slow and unreliable government-owned, fixed-line telephone systems. Today mobile phones are ubiquitous and in some African countries more people have access to a mobile phone than to clean water, a bank account, or even electricity. The wide-scale adoption of smartphones, which can now be purchased in many African cities for under $100, will open new possibilities for web-based applications and e-commerce, allowing Africa to "leapfrog" past more developed markets (World Bank and African Development Bank, 2012).

Already mobile phones are transforming the way that business is conducted on the continent. In rural areas throughout Africa, farmers can use mobile applications like Esoko, developed by a Ghanaian start-up, or M-Farm, the brainchild of a 26-year-old Kenyan computer scientist, to check market prices for their crops while they are still in the fields, giving them enhanced negotiating leverage with local buyers (McKinsey, 2013). And in cities like Nairobi, commuters can pay their fares on private minibuses (*matatus*) without having to dig into their pockets for change thanks to Bebapay, a cashless, prepaid card system launched in 2013 by Google and Kenya's Equity Bank. Passengers simply tap their cards to their conductors' smartphones and money is digitally transferred from card to phone. The service has been so successful that Kenya's transportation authority is in the process of moving entirely to a cashless model (BBC, 2014).

A fifth innovation catalyst has been the growth of the Internet. Owing to massive investments in network infrastructure, Internet penetration across the continent grew from negligible levels in 2000 to about 16 percent in 2013, with far higher levels in urban areas (McKinsey, 2013). Already there are more Internet users in Nigeria than in either the UK or France, with the number of subscribers in Africa's largest country set to jump to 84.3 million in 2018 from 51.8 million in 2013 (eMarketer, 2014).

In addition to the role that the Internet has played as an agent of change in the telecommunications and banking sectors by giving formerly unbanked citizens access to mobile payments, it has served as a platform for innovation in other sectors such as health care, where entrepreneurs like Arthur Zang from Cameroon are designing diagnostic tools like the Cardiopad, a touch-screen medical tablet computer, to expand medical services to rural areas (Holland et al., 2012); in education, where entrepreneurs like Rapelang Rabana from South Africa are launching new mobile tools like ReKindle Learning to help students practice lessons outside the classroom (McKinsey, 2013); and in agriculture, where entrepreneurs like Su Kahumbu from Kenya have introduced mobile applications like iCow that provide dairy farmers with real-time pricing information and SMS reminders about milking schedules and immunization dates (Hussey, 2015).

And there is great potential for future Internet-driven growth, as smartphone penetration increases, bandwidth costs decline, and the size of Africa's middle class mushrooms. Indeed, by 2025, Africa could have as many as 600 million Internet users, generating $75 billion in annual e-commerce sales, and contributing as much as $300 billion a year to Africa's GDP (McKinsey, 2013).

Innovation as national policy

Africa has traditionally been the world's poster child for poor governance – a continent dominated by corrupt dictators and authoritarian "big men" who have plundered national treasuries and doled out government jobs, contracts, and favors to members of their patronage networks. At the heart of the problem are the "extractive institutions" that underpin Africa's economic and political life (Acemoglu and Robinson, 2012). Unlike the "inclusive institutions" prevalent in the West, which tend to emphasize competition, procedural fairness, and respect for property rights, extractive institutions tend to concentrate power and opportunity in the hands of a few and encourage rent-seeking activities that generate private wealth yet public misery. One manifestation of extractive institutions is the tradition of single-party political rule that has been a hallmark of African politics during the postcolonial period. Africa's penchant for political monopolies has resulted in social exclusion, strife, and a business environment marked by protectionism and corruption (Harrison et al., 2013).

During the early 1990s, many African countries put political reform front and center, casting out military leaders, convening multiparty elections, and imposing term limits on elected officials (Berman, 2013). Today, nearly all of Africa's 55 nations hold regular, multiparty elections and only four – Eritrea, Swaziland, Libya, and Somalia – lack a multiparty constitution (*The Economist*, 2012a). And while the progress towards democracy across the continent has been uneven with regular setbacks – as the 2012 military coups in Guinea-Bissau and Mali attest – the overall trend has been in the direction of political reform, with countries like Mauritius and Botswana leading the way. Indeed, those two countries rank ahead of more affluent countries such as France and Italy in the Economist Intelligence Unit's 2013 Index of Democracy, which measures the breadth and depth of democratic governance in 165 nations (The Economist Intelligence Unit, 2013).

One of the most salutary results of political reform has been the change in macroeconomic policy across the continent, with governments eschewing populism in favor of sound money, balanced budgets, and debt reduction (Devarajan and Fengler, 2013). Another consequence of political reform has been the changing of the guard in government ministries across the continent, with a new generation of globally experienced technocrats assuming leadership positions (Green and Whitehead, 2013). Not surprisingly, the influx of technocrats into positions of political power has led to the growing embrace of ICT-based solutions for government functions. A pioneer in the e-government space is South Africa. The South African Revenue Service launched its eFiling tax system in 2003, which streamlined the tax preparation process for companies and shortened the turnaround time for refunds. Today it takes South African companies on average 68 fewer hours to complete and file their tax returns than the global average (PWC, 2014).

Case study in innovative governance: Rwanda

Rwanda is an unlikely governance success story. The landlocked East African nation of 12 million was convulsed by genocidal violence in 1994 orchestrated primarily by the majority ethnic Hutus against the minority Tutsis. Between 800,000 and 1 million civilians were killed during 100 days of bloodletting – more than have been killed during any similar period of time in human history including the Holocaust (Gettleman, 2013). Meanwhile, the country's social institutions were destroyed and the economy was left in a shambles. When Tutsi rebels seized power and ended the genocide, Rwanda was teetering on the brink of chaos. With no oil, natural gas, or other natural resources at its disposal, Rwanda appeared destined to become a failed state or permanent United Nations protectorate (Ensign and Mukantabana, 2014).

Two decades later Rwanda has risen from the ashes and is widely regarded as an African economic showcase. While still amongst the poorest countries in the world, Rwanda has experienced rapid economic growth in recent years, averaging 8 percent annually between 2001 and 2013 (World Bank, 2014b). That growth, coupled with large infusions of foreign assistance from the US and Europe, has helped lift 1 million Rwandans out of poverty. Rwanda has also experienced dramatic improvements in life expectancy, literacy, and infant mortality. And thanks to an innovative national health insurance program launched in 1999, nearly all Rwandans have health care.

Rwanda has also made great strides on the gender equality front. During the genocide period, Rwanda's women suffered unspeakable crimes, including an estimated 250,000–500,000 being raped (Topping, 2014). Today, gender rights are enshrined in its constitution, and women have the legal right to inherit land, share the assets of a marriage, and obtain credit (Topping, 2014). Moreover, Rwanda has the highest percentage of female legislators in the world, with women holding nearly two-thirds of all seats in parliament and one-third of all cabinet positions, including the ministries of foreign affairs, agriculture, and health (Olopade, 2014).

Rwanda has also improved its business environment. It is perennially ranked among the least corrupt nations in Africa by antigraft watchdog Transparency International, and its capital, Kigali, is widely regarded as one of the cleanest and safest cities on the continent. Rwanda is also among the easiest places on the continent to do business. Indeed, in 2014, Rwanda ranked 46 on the World Bank's Ease of Doing Business Index – third in Africa behind only Mauritius (28) and South Africa (43), and ahead of some more developed countries like Italy. Its neighbors, by comparison, ranked 131 (Tanzania), 150 (Uganda), 152 (Burundi), and 184 (Democratic Republic of Congo) (World Bank, 2014a).

Most observers attribute Rwanda's stunning turnaround to its visionary, if controversial, leader Paul Kagame. A commander of the rebel Rwandan Patriotic Army, which seized power in 1994, Kagame has led the country since 2000 and presided over its economic renaissance with ruthless efficiency. A devotee of Singapore's Lee Kuan Yew, the twice-elected Kagame has sought to create a modern, developmental state fueled by foreign investment.

Under Kagame's Vision 2020 plan, launched early in his presidency, Rwanda has taken steps towards reducing its dependence on foreign aid and moving from subsistence agriculture to services. A key pillar of the plan has been investment in ICT. In recent years the Rwandan Information Technology Authority has installed over 1000 miles of fiber-optic cable, and in 2013 it signed a deal with Korea Telecom to build a nationwide 4G LTE broadband network that will provide broadband access to 95 percent of Rwanda's citizens by 2016 (Smith, 2013). Other ICT initiatives include the Smart Kigali program, launched in 2013, which has provided free Wi-Fi to schools, hotels, taxi stations, and public bus stations throughout the capital (Gasore and Kanyesigye, 2013), and the Smart Rwanda Master Plan, unveiled in 2014, which aims to provide better services to citizens through e-government (Melhem, 2014). Kagame himself has been dubbed the "Digital President" by the International Telecommunications Union and has an active social media presence, with more Twitter followers than any other African leader (IT News Africa, 2014).

The Rwandan government's zeal for technology-based solutions has attracted the interest of foreign multinationals like Visa, which recently selected Rwanda as the test market for MVisa, an interoperable mobile payments service (McGroarty and Sidel, 2013). Foreign universities too have been attracted by Rwanda's ICT push. Carnegie Mellon University established a campus in Kigali in 2011, offering graduate programs in information technology and electrical and computer engineering (Juma, 2011). Both of these investments will enhance Rwanda's stock of human capital and position the country as a technology hub for East Africa.

And while Kagame has come under increasing criticism in recent years for his authoritarian proclivities and interventions in the affairs of his neighbors (Gettleman, 2013), most agree that he has been a tireless and effective champion of innovative governance and economic development. As Chu (2009) observes:

> Kagame sends fact-finding missions to Asia. He pursues the Rwandan diaspora. He speaks at Google and meets American entrepreneurs. He recruits more friends. And it's beginning to look as if his personal strategy – selling people on Rwanda's story and its promise, telling them that this is a place where they can make a difference as well as profits – just might work.

Case study in innovative governance: Lagos, Nigeria

The city-state of Lagos, Nigeria, is another surprising governance success story. For years the sprawling megacity on West Africa's Gulf of Guinea was regarded as virtually ungovernable – a morass of crime, corruption, pollution, poverty, and decay. But the city of 21 million began to turn things around in the late 1990s under reform-minded Governor Bola Tinubu (1999–2007), who launched an ambitious tax collection initiative that helped wean the city-state from its dependence on financial transfers from the federal government. Lagos's fortunes took a dramatic turn for the better under Tinubu's successor and former chief of staff, Babatunde Fashola (2007–present). Fashola redoubled the government's tax-collection efforts by dispatching teams of private collectors to visit companies to explain the tax payment process and urge compliance. Tax audits, meanwhile, increased by over 300 percent between 2006 and 2011. The result has been a fourfold increase in tax revenue – a feat accomplished without raising tax rates (de Gramont, 2015).

Fashola has used the tax windfall, along with funds raised in global capital markets, to launch an ambitious $50 billion public works program that has included the construction of new highways, a commuter rail metro system, a bus rapid transport system, and West Africa's first suspension bridge (Kaplan, 2012). The new infrastructure, coupled with the installation of scores of solar-powered traffic lights at heavily congested intersections, has eased Lagos's infamous "go-slows." Fashola has also curbed blight by demolishing shanty towns and encouraging occupants to return to their rural villages, and battled street crime by deploying more police officers to high-crime areas and hiring "area boys" – unemployed youth known for preying on pedestrians and motorists – to sweep city streets (Rice, 2012). Fashola's government has further earmarked millions of dollars in funds for sanitation, affordable housing, and "beautification projects" involving the planting of trees and creation of public parks.

In addition to delivering public services to his constituents, Fashola has impressed Lagosians with his commitment to transparency and the rule of law. His administration is one of the few in Nigeria that publishes a detailed budget on the Web, and he himself is widely seen as incorruptible (*The Economist*, 2011). His reputation for integrity was burnished in 2012 when he chased down and arrested a senior military officer for driving his vehicle in one of the city's dedicated bus lanes. While television cameras rolled, Fashola chastised the officer, telling him that there would be zero tolerance for lawlessness. As one foreign journalist observed, "It was one of the first times Nigerians had ever seen a civil servant confronting a member of the security forces, whose fondness for committing crime rather than fighting it has long contributed to Lagos's legendary reputation for lawlessness" (Freeman, 2014).

Fashola has also championed technological innovation. In 2011, with the assistance of Harvard University's Kennedy School of Government, he established the Lagos Innovation Advisory Council, a 20-member body charged with advising the state government on how to promote entrepreneurship and technological dynamism (Juma, 2011). Comprising members from the private sector, government, and academia, the Council has helped launch the Lagos Innovation Hotspots Map and the Lagos Angel Network. The former, a partnership with Co-Creation Hub, a private technology incubator, provides investors and policy makers with data on innovation clusters across the city; the latter brings entrepreneurs together with potential investors to help jump-start fledging businesses (*The Economist*, 2012b). These initiatives have encouraged a wave of technology start-ups, earning Lagos the reputation of "Africa's smartphone app capital" (Moules, 2014).

Fashola's accomplishments have made him a popular figure at home. He won reelection in 2011 with 81 percent of the vote. And thanks in part to his expert handling of the Ebola crisis in 2014 (Freeman, 2014), he would be a heavy favorite to win a third mandate in 2015 if eligible to stand again.

Fashola's efforts have also garnered recognition from abroad. In 2012, Lagos was nominated as one of the world's 25 most innovative cities (Akinsanmi, 2012). Meanwhile, the city's turnaround has attracted the interest of foreign MNEs like Nissan, which has announced plans to build an assembly factory there (Walt, 2014).

Firm-level innovation

Notwithstanding the important governance reforms being implemented throughout Africa, arguably the most important action on the innovation front is taking place at the firm level, where both start-ups and established firms are launching new products and services to satisfy consumer demand and fill market voids. What follows is a survey of developments in three key sectors: financial services, retail and consumer goods, and food and beverages.

Financial services

In recent years Africa has emerged as the undisputed world leader in mobile banking. Ground zero for the revolution is Nairobi, Kenya, the birthplace of M-Pesa, a mobile payments service launched by Safaricom, the country's largest wireless operator and the Kenyan subsidiary of Vodafone Group PLC.

Prior to the advent of M-Pesa ("pesa" means money in Swahili), many Kenyans kept their savings stuffed in mattresses and transferred money to relatives by handing off cash-filled envelopes to bus drivers or couriers, and hoping for the best. As a largely unbanked society – four-fifths of Kenyans do not have bank accounts – Kenya was ripe for technological disruption. Enter M-Pesa, the brainchild of former Safaricom CEO Michael Joseph, who saw the potential of mobile money to transform Kenya's economy. Taking advantage of lax governmental rules on financial services and only token opposition from incumbent financial institutions, which did not perceive the mobile payments scheme as a threat to their core business, Joseph and his colleagues quietly rolled out the service in 2007 (Olopade, 2014).

M-Pesa caught on fast with Kenyans. Today an estimated 20 million Kenyans have M-Pesa accounts and use the service to conduct 700 million transactions worth more than $20 billion annually – a number equivalent to 45 percent of Kenya's annual GDP (Njogu, 2014). In addition to improving the lives of millions of Kenyans, mobile payments services like M-Pesa are serving as a platform for the emergence of new businesses, many of which cater to the poor. A case in point is M-Kopa LLC, a Kenyan start-up that finances the purchase of solar panels by villagers in rural Kenya living off the power grid. The villagers make a small down payment on the equipment – a solar panel and control box – and then daily payments using M-Pesa for about a year until the equipment is paid off. The solar panels, which are typically installed on the rooftops of homes or mud-walled huts, generate electricity that is considerably cheaper, safer, and cleaner than kerosene, and can be used to power reading lamps, refrigerators, and mobile phones (McGregor, 2012; Vogt, 2015). Buoyed by strong demand for its services and $20 million in annual revenue, M-Kopa has begun licensing its technology in other markets such as Ghana (Jackson, 2015).

Other mobile-payments-based businesses that have emerged to serve Kenya's poor include Kopa Kopa Inc., a firm that offers digital payment solutions for merchants, and M-Changa Ltd, a company that has created a mobile crowd-funding platform allowing individuals to tap the resources of extended families to pay for events like weddings and funerals (Vogt, 2015). Meanwhile, established companies like UAP Insurance and Britam Kenya have used M-Pesa as a platform to offer new services to their customers, including crop insurance and affordable medical insurance (*The Economist*, 2010b).

Retail and consumer goods

The digital payments revolution launched by M-Pesa in Kenya, coupled with the explosive growth of the Internet across the continent, is shaking up Africa's retail and consumer goods sector. And nowhere has the shake-up been felt more acutely than in Nigeria, where a host of start-up online retailers (e-tailers) are threatening bricks-and-mortar incumbents and jockeying for position in Africa's largest and fastest-growing consumer market.

Among the most promising of these e-tailers is Jumia.com. Founded in 2012, Jumia is an online shopping emporium that sells more than 100,000 products, including books, DVDs, consumer electronics, clothing, and appliances. Jumia's customers typically place their orders online with a PC or mobile phone (the company has developed its own Android app), or by dialing into its call center. But Jumia also offers in-person sales with teams of tablet-toting agents, which it dispatches to businesses, churches, and even private homes to educate consumers about web commerce (Kay et al., 2013). In addition to accepting credit and debit cards, Jumia allows customers to pay for purchases in monthly installments. It also accepts payment upon delivery – a key innovation given that many Nigerians continue to be wary about using credit cards for online purchases.

Thus far the privately owned company, which has raised over $150 million in venture capital, has enjoyed steady sales growth. And while the 170-million-consumer Nigerian market offers plenty of room for growth, the company has wider aspirations. It has already launched its service in South Africa, Kenya, Ivory Coast, Egypt, Morocco, Ghana, Uganda, and Cameroon, and plans to expand further throughout the continent. It is also views the Nigerian diaspora as a potentially lucrative market and has rolled out a website in the UK (jumia.co.uk), where Nigerian expatriates can purchase goods and have them delivered to family and friends back home in less than half the time it normally takes for Amazon to ship them from the UK (Pooler, 2014).

Food and beverages

Whereas Internet start-ups like Jumia are leading the innovation charge in retailing and consumer goods, large multinationals – many from South Africa – are the primary source of innovation in the continent's food and beverages sector. One of those is SABMiller. Founded in South Africa in 1895, the London-headquartered SABMiller is the world's second-largest brewer, with operations in 75 countries and a portfolio of more than 150 brands that together generate $31 billion in revenue (Berman, 2013). SABMiller began its African expansion in the 1990s, acquiring privatized breweries in Mozambique, Ghana, Uganda, Zambia, and Tanzania, and spending millions of dollars to modernize them. Today the company has operations in 15 African countries and a stake in 21 other breweries through its alliance with France's Castel. These investments have paid handsome dividends: the Africa region (not including South Africa) today accounts for 13 percent of the firm's profits – more than twice the global average (*The Economist*, 2014d).

And while SABMiller's biggest market on the continent continues to be South Africa, where its brands account for 90 percent of local consumption, its focus is increasingly on fast-growing markets to the north, like Uganda, where it recently spent $80 million to build a new brewery to double the capacity of its Nile Breweries subsidiary (Lucas and Manson, 2012), and Nigeria, where it has built breweries in the cities of Port Harcourt, Ibadan, and Onitsha (Ryan, 2014).

One of the key elements in SABMiller's African strategy is branding: it aims to give each of its beers a distinct local identity by choosing names and symbols that resonate with local populations. In Zambia its leading brand is called Mosi (the local name for Victoria Falls); in Tanzania it is Kilimanjaro. Hero, its top seller in Nigeria, carries a rising sun on its label – an icon of the Igbo tribe (*The Economist*, 2014e).

Another key element of SABMiller's strategy is pricing its beers competitively. This is important because large numbers of Africans continue to consume a variety of cheap and often dangerous concoctions known as "home brews." Getting them to switch to safer and higher-quality, factory-produced beer requires offering a product that is aspirational but affordable. It has achieved that with Hero, its Nigerian lager, which sells for about 25 percent less per bottle than Star, the market leader, and 40 percent less than Guinness, another top seller (*The Economist*, 2014a).

A third element of its strategy is developing new alcoholic beverages, like Chibuku, that appeal to low-income consumers who have traditionally opted for home brews. Made from locally grown maize and sorghum, Chibuku, also known as "Shake-Shake," since its contents tend to separate unless shaken, was developed in Zambia and has been a huge hit there, and in neighboring South Africa, where sales nearly doubled between 2008 and 2013 (Ryan, 2014). Sold in cardboard boxes, Chibuku is popular with the rural poor who value its tangy flavor and porridge-like consistency.

Cheaper to manufacture than traditional lagers – thanks in part to generous tax concessions awarded by governments anxious to promote farm-sector employment – Chibuku delivers high profit margins (Sonne et al., 2013). The beverage does, however, have a serious drawback: since it is sold in a partially fermented state, it may explode if not consumed within a week. To solve this issue, SABMiller developed "Chibuku Super," an upscale version sold in plastic bottles with a longer shelf life. The company expects the product, launched in 2013, to have strong appeal in Zimbabwe, Zambia, and Botswana, with sales ultimately outstripping those of traditional lagers by two to one (Ryan, 2014).

SABMiller has also innovated by introducing budget-priced, lager-style beers made from locally produced roots and tubers (Dontoh and Kew, 2013). Its first offering, Eagle Lager, hit Uganda's shelves in 2002. The translucent, sorghum-based ale quickly became one of East Africa's best-selling beers (*The Economist*, 2012c). As a follow up, it introduced Impala, the world's first commercially made cassava beer, in Mozambique in 2011. That too has enjoyed success, while generating new sources of income for over 2,000 smallholder cassava farmers that supply the brewer. SABMiller has since launched a cassava-based beer in Ghana, and may do so elsewhere on the continent (Sonne et al., 2013).

As for its home market of South Africa, SABMiller continues to innovate there too. It recently kicked off a program to finance renovations at 6,000 pubs across the country to attract more female patrons, who represent a fast-growing segment (Kew and Fletcher, 2014). It has also rolled out new products with feminine appeal, including fruit-flavored drinks like Brutal Fruit Mango Goji and fresh orange and crushed lemon varieties of its popular Flying Fish lager (Kew and Fletcher, 2014).

Facilitation institutions as agents of innovation

While private firms and governments may be the leading catalysts of innovation in Africa, a wide range of institutions are playing the critical role of innovation facilitators. These institutions, which range from small, nonprofit organizations to large multinational companies, are providing entrepreneurs with technical information, know-how, connections, and capital to grow their businesses. Foremost amongst these institutions is the growing number of innovation hubs and tech accelerators that cater to the continent's aspiring high-tech entrepreneurs.

Innovation hubs and tech accelerators

One of Africa's most heralded innovation hubs is Kenya's iHub (ihub.co.ke). Established in 2010 with funding from the Omidyar Network, a US-based philanthropic investment firm, and Hivos, the Dutch international development NGO, iHub bills itself as the center of Nairobi's burgeoning technology movement. Like other innovation hubs in Africa, iHub provides a communal space where entrepreneurs can collaborate, along with an in-house consulting arm that helps members develop investor-ready business plans. It also offers an incubation space for firms developing mobile applications (*The Economist*, 2012d). Boasting more than 13,000 members, iHub claims to have helped launch more than 150 Kenyan companies, among them M-Farm and iCow, the makers of mobile apps for farmers, and MedAfrica, a software start-up that has devised a program that enables users to self-diagnose medical ailments and connect with specialists (Hussey, 2015). In recognition of the key role that iHub has played in Kenya's recent development, *Fast Company* selected it in 2014 as one of the ten most innovative "companies" in Africa.

Nigeria's Co-Creation Hub (CcHub) is another highly touted innovation hub. Established in 2011 by Nigerian tech enthusiasts with support from the Omidyar Network and the UK-based nonprofit Indigo Trust, CcHub describes itself as a preincubation space where entrepreneurs can "work to catalyze creative social tech ventures" (cchubnigeria.com). In addition to hosting brainstorming sessions, focus groups, meet-ups, lectures, workshops, and hackathons, CcHub provides a mentoring service for entrepreneurs with up to 20 start-ups receiving support at any given time (Nsehe, 2011).

Like innovation hubs, tech accelerators work with start-ups to speed up their maturation. But in addition to providing a shared space, mentoring, and networking opportunities, accelerators typically provide intensive training (i.e., boot camps), seed money, and introductions to potential investors, usually in exchange for equity stakes in the fledgling companies. Among the most prominent of Africa's tech accelerators is Kenya's 88mph. Founded in Nairobi in 2011 by a Danish entrepreneur and a Kenyan businessman who met at Stanford University, 88mph has already raised more than $4.5 million from African and European investors and funded nearly three dozen companies through its three-month "start-up garage" program (Coetzee, 2015).

The latest addition to the list of accelerators and accelerator-like programs is the Tony Elumelu Foundation Entrepreneurship Program. Founded in 2014 by Nigerian billionaire Tony Elumelu, the $100 million program aims to help launch over 10,000 new businesses over the next decade. Each of the 1,000 African entrepreneurs selected for the program each year will receive $5,000 in seed capital and an additional $5,000 in "returnable capital," which they will use to establish and grow their businesses. The program, which includes 12 weeks of online mentoring and training, will culminate in a three-day forum in Nigeria where participants will meet and pitch their ideas to investors. The Foundation hopes the program will ultimately spawn 1 million new jobs and generate $10 billion in new revenues, while boosting intra-African trade (Keeler, 2014).

Venture capital and private equity firms

Another important category of innovation facilitators are foreign venture capital (VC) firms, which have been drawn to tech centers like Nairobi and Lagos in recent years in search of the next Internet juggernaut. Among the most active of these VC firms are Rocket Internet, a Berlin-based "clone" firm that seeks to replicate successful business models like that of Amazon.com in emerging markets (*The Economist*, 2014c), and Tiger Management, a New York-based investment fund. The former has raised $150 million for Nigerian e-tailer Jumia, whereas the latter has raised $100 million for South African web commerce giant Takealot, and millions more for iROKOtv, a Nigerian online music and movie distributor hailed as the "Netflix of Africa" (Moules, 2014; Coetzee, 2015). Other VC firms active on the continent include Sweden's AB Kinnevik and South Africa's Naspers, which together have raised $40 million for Nigerian e-tailer Konga.com (Rice, 2013). The capital provided by these VCs has allowed their start-up clients to expand product offerings, redesign websites, modernize warehouses, rationalize supply chains, and launch innovative marketing campaigns.

Private equity (PE) firms represent another important vehicle for innovation, raising a record $4 billion for investments in African companies in 2014 (*The Economist*, 2015). Leading PE investors in Africa include the Carlyle Group, the Blackstone Group, and Helios Partners. While much of the PE money entering Africa in recent years has been earmarked for utilities and heavy industry, a growing share is going to companies in consumer-facing industries. Emerging Capital Partners (ECP), for instance, made a major investment in the Kenyan coffee-house chain Nairobi Java House in 2012, enabling it to expand its footprint to Mombasa, Nakuru, and Kisumu, and launch a chain of frozen yogurt outlets (*The Economist*, 2015). And in 2014, the New York-based PanAfrican Investment Co. announced an undisclosed investment in Mobius Motors, a Kenyan automobile start-up with plans to build an affordable all-road vehicle for Africa's mass market (Nsehe, 2014).

Multinational enterprises

MNEs are also playing a key role in facilitating innovation on the continent through greenfield investments and acquisitions. Such investments often result in the transfer of valuable technology, know-how, and best practices to affiliates and host societies (UNCTAD, 2014). But a handful of leading MNEs are taking their commitment to the continent's technological development even further by establishing innovation hubs and research labs on the continent. IBM is one such company. The US tech giant announced plans in 2013 to build a research lab in Nairobi. The lab – its first in Africa and one of only a dozen worldwide – will work on developing applied, data-driven solutions to problems caused by rapid urbanization, including water and energy scarcity, education and health-care inadequacy, and traffic congestion (*The Economist*, 2013). Dutch electronics firm Philips also opened a research laboratory in Nairobi in 2013 to develop technology-based health-care and lighting solutions (*The Economist*, 2014b). One of its first projects is a hand-powered ultrasound fetal heart rate monitoring device for use in rural areas with irregular electricity supplies (Jack, 2014).

Nonprofit organizations

No discussion of innovation facilitators would be complete without mentioning the key role played by foreign nonprofit organizations in promoting novel solutions to the continent's social and environmental challenges. Foremost among these organizations are the Bill and Melinda Gates Foundation and the Clinton Global Initiative, which fund a variety of important projects in the areas of health, education, sanitation, and sustainable enterprise. But smaller and less well-known institutions are also making a mark. One such organization is KickStart International, a San Francisco-based nonprofit that sells low-tech irrigation pumps to smallholder farmers throughout the continent. The devices, which can irrigate up to two acres a day, are expensive by local standards – costing between $75 and $160 each – but are well worth the investment, as they allow farmers to switch from seasonal to year-round production, thereby boosting returns (Lesle, 2013).

Conclusion

Africa is clearly a continent on the move. The mood of pessimism that has long prevailed is giving way to one of hope and optimism. Perhaps the most encouraging aspect of Africa's recent economic rise, as Kelly (2014) observes, is that it is a largely homegrown phenomenon, being driven primarily by local companies developing local content (e.g., software and mobile apps) for local consumers. This is in stark contrast to the continent's traditional growth model, which has been driven by foreign extractive companies and agribusinesses, using foreign know-how for the benefit of foreign consumers. Taking Africa's growth to the next level, however, will require tackling thorny obstacles that continue to stymie innovation and thwart would-be entrepreneurs, such as poverty, poor infrastructure, weak governance, fragile security, and the shortage of human capital, electricity, and investment capital. Solving these challenges will require creative thinking, ingenuity, political will, and plenty of *kazi ngumu* (Swahili for "hard work"). Africa's new generation of business and government leaders clearly have their work cut out. But if they can continue to push forward with political and economic reforms, harnessing the power of information technology and the skills and resources of foreign partners including the Africa diaspora, some of the continent's nascent innovation hills may yet rise to become peaks.

References

Acemoglu, D. and Robinson, J. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Crown Publishers.

Akinsanmi, G. (2012). "Lagos Emerges Africa's Most Innovative City." *This Day Live*. Retrieved from http://www.thisdaylive.com/articles/lagos-emerges-africa-s-most-innovative-city/128001/

BBC. (2014). "Kenya's Matatu Bus System to Go Cashless." *BBC News*. Retrieved from http://www.bbc.com/news/business-28106004

Berman, J. (2013). *Success in Africa: CEO Insights from a Continent on the Rise*. Brookline, MA: Bibliomotion.

Chu, J. (2009). "Rwanda Rising: A New Model of Economic Development." *Fast Company*. Retrieved from http://www.fastcompany.com/1208900/rwanda-rising-new-model-economic-development

Coetzee, J. (2015). "8 Exciting African Startup Programmes and Accelerators to Watch in 2015." *Ventureburn*. Retrieved from http://ventureburn.com/2015/01/8-exciting-african-entrepreneurship-programmes-watch-2015/?device=desktop

de Gramont, D. (2015). "Governing Lagos: Unlocking the Politics of Reform." *Carnegie Endowment for International Peace*. Retrieved from http://carnegieendowment.org/2015/01/12/governing-lagos-unlocking-politics-of-reform/hz99

Deloitte. (2014). "The Deloitte Consumer Review: Africa: A 21st Century View." Retrieved from http://www2.deloitte.com/uk/en/pages/consumer-business/articles/africa-a-21st-century-view.html

Devarajan, S. and Fengler, W. (2013). "Africa's Economic Boom." *Foreign Affairs*. Retrieved from http://www.foreignaffairs.com/articles/139109/shantayanan-devarajan-and-wolfgang-fengler/africas-economic-boom

Dontoh, E. and Kew, J. (2013). "SABMiller Sells Cassava Beer to Woo African Drinkers." *BloombergView*. Retrieved from http://www.bloomberg.com/bw/articles/2013-05-23/sabmiller-sells-cassava-beer-to-woo-african-drinkers

eMarketer. (2014). "Internet to Hit 3 Billion Users in 2015." Retrieved from http://www.emarketer.com/Article/Internet-Hit-3-Billion-Users-2015/1011602

Ensign, M. M. and Mukantabana, M. (2014). "Rwanda 20 Years Later: A Model for Progress and Reconciliation." *Christian Science Monitor*. Retrieved from http://www.csmonitor.com/Commentary/Opinion/2014/0407/Rwanda-20-years-later-A-model-for-progress-and-reconciliation

Florida, R. (2005). "The World Is Spiky." *The Atlantic*. Retrieved from http://www.theatlantic.com/past/docs/images/issues/200510/world-is-spiky.pdf

Freeman, C. (2014). "Meet the Man Who Tamed Nigeria's Most Lawless City." Retrieved from http://www.telegraph.co.uk/news/worldnews/africaandindianocean/nigeria/11184759/Meet-the-man-who-tamed-Nigerias-most-lawless-city.html

Gasore, B. and Kanyesigye, F. (2013). "Rwanda: 'Smart Kigali' Brings Free Internet to City." *The New Times (Kigali)*. Retrieved from http://allafrica.com/stories/201309231105.html

Gettleman, J. (2013). "The Global Elite's Favorite Strongman." *The New York Times*. Retrieved from http://www.nytimes.com/2013/09/08/magazine/paul-kagame-rwanda.html

Global Innovation Index. (2014). *The Global Innovation Index 2014: The Human Factor in Innovation*. Retrieved from https://www.globalinnovationindex.org/content.aspx?page=GII-Home

Green, A. and Whitehead, E. (2013). "Africa's Next Generation." *This Is Africa*. Retrieved from http://www.thisisafricaonline.com/Policy/Africa-s-next-generation?ct=true

Harrison, A., Yifu Lin, J., and Xu, C. (2013). "Explaining Africa's (Dis)advantage." *The National Bureau of Economic Research*, paper 18683. Retrieved from http://www.nber.org/papers/w18683.pdf

Holland, M., Tucker, I., Mark, M., Kelly, A., and Honigsbaum, O. (2012). "Africa Innovations: 15 Ideas Helping to Transform a Continent." *The Guardian*. Retrieved from http://www.theguardian.com/world/2012/aug/26/africa-innovations-transform-continent

Hussey, M. (2015). "Silicon Savannah – How Start-ups in Africa Are Taking on Some of Humanity's Biggest Challenges." *The Huffington Post*. Retrieved from http://www.huffingtonpost.co.uk/matthew-hussey/african-startups-take-on-challenges_b_6416676.html

IT News Africa. (2014). "Rwanda's President Tweeting up a Storm." Retrieved from http://www.itnewsafrica.com/2014/10/rwandas-president-tweeting-up-a-storm/

Jack, A. (2014). "Low Technology and Innovative Funding Carry Africa's Hopes." *Financial Times*. Retrieved from http://www.ft.com/intl/cms/s/0/ca2e7f66-6f3a-11e4-8d86-00144feabdc0.html?siteedition=intl#axzz3Qcq7PRqQ

Jackson, T. (2015). "Africa's New Breed of 'Solar-Preneurs.'" *BBC News*. Retrieved from http://www.bbc.com/news/business-30805419

Juma, C. (2011). "Africa's New Engine." *International Monetary Fund*. Retrieved from http://www.imf.org/external/pubs/ft/fandd/2011/12/juma.htm

Kaplan, S. (2012). "City Development States: Why Lagos Works Better than Nigeria." Retrieved from http://www.policyinnovations.org/ideas/innovations/data/000212/:pf_printable?sourceDoc=000065

Kay, C., Spillane, C., and Kew, J. (2013). "Trying to Build the Next Amazon in Nigeria." *Bloomberg*. Retrieved from http://www.bloomberg.com/bw/articles/2013-11-21/jumia-africas-amazon-dot-com-takes-cash-and-delivers-by-motorbike

Keeler, D. (2014). "Elumelu Foundation Launches $100m Program to Boost African Business." *Frontier Markets*. Retrieved from http://blogs.wsj.com/frontiers/2014/12/01/elumelu-foundation-launches-100m-program-to-boost-african-business/

Kelly, T. (2014). "Tech hubs across Africa: Which will be the legacy-makers?" The World Bank Informational and Communications for Development (IC4D) Blog. Retrieved from http://blogs.worldbank.org/ic4d/tech-hubs-across-africa-which-will-be-legacy-makers

Kew, J. and Fletcher, C. (2014). "SABMiller Cleans up South Africa's Bars to Attract Women." *Bloomberg*. Retrieved from http://www.bloomberg.com/bw/articles/2014-05-29/sabmiller-cleans-up-south-africas-bars-to-attract-women

Lesle, T. (2013). "The Simple Water Pump that's Changing Lives across the World." *WIRED*. Retrieved from http://www.wired.com/2013/12/2112kickstart/

Lucas, L. and Manson, K. (2012). "Brewers See New Horizons in Africa." *Financial Times*. Retrieved from http://www.ft.com/intl/cms/s/0/7b7e1c84-5343-11e1-aafd-00144feabdc0.html?siteedition=intl#axzz3Qcq7PRqQ

McGregor, S. (2012). "Kenya's M-KOPA Gives Phone-Loans to Put Solar Power in Reach." *Bloomberg*. Retrieved from http://www.bloomberg.com/news/2012-10-04/kenya-s-m-kopa-offers-cheaper-solar-power-to-off-grid-villages.html

McGroarty, P. and Sidel, R. (2013). "Visa Plants a Seed for Growth Abroad." *Wall Street Journal*. Retrieved from http://www.wsj.com/articles/SB10001424127887323687604578466671317052766

McKinsey. (2013). "Lions Go Digital: The Internet's Transformative Potential in Africa." Retrieved from http://www.mckinsey.com/insights/high_tech_telecoms_internet/lions_go_digital_the_internets_transformative_potential_in_africa

Melhem, S. (2014). "Smart Africa Returns with a Focus on Rwanda." *Information and Communications for Development*. Retrieved from http://blogs.worldbank.org/ic4d/smart-africa-returns-focus-rwanda

Moules, J. (2014). "Apps Mean Jobs for Young Nigerians." *Financial Times*. Retrieved from http://www.ft.com/intl/cms/s/0/77df79a8-c716-11e3-889e-00144feabdc0.html#axzz3PJbocDnu

Njogu, L. (2014). "Top 10 List of Most Destructive Technologies in Kenya." *PIVOT East*. Retrieved from http://www.pivoteast.com/top-10-list-destructive-technologies-kenya-last-5-years/

Nsehe, M. (2011). "EBay Billionaire Omidyar Gives Nigerian Tech Incubator $200,000." *Forbes*. Retrieved from http://www.forbes.com/sites/mfonobongnsehe/2011/07/20/ebay-billionaire-omidyar-gives-nigerian-tech-incubator-200000/

Nsehe, M. (2013). "Meet the Entrepreneur Working to Challenge Nokia, Blackberry and Samsung in Africa." *Forbes*. Retrieved from http://www.forbes.com/sites/mfonobongnsehe/2013/04/30/meet-the-entrepreneur-working-to-challenge-nokia-blackberry-and-samsung-in-africa/

Nsehe, M. (2014). "American Billionaire Ronald Lauder Is Funding Africa's Cheapest Car." *Forbes*. Retrieved from http://www.forbes.com/sites/mfonobongnsehe/2014/05/12/american-billionaire-ronald-lauder-is-funding-africas-cheapest-car/

Olopade, D. (2014). *The Bright Continent: Breaking Rules and Making Change in Modern Africa*. New York: Houghton Mifflin Harcourt.

Pooler, M. (2014). "Internet Retailer Tapping into Diaspora Dollars." *Financial Times*. Retrieved from http://blogs.ft.com/beyond-brics/2014/06/20/internet-retailer-tapping-into-diaspora-dollars/

PWC. (2014). *Paying Taxes 2015: The Global Picture*. Retrieved from http://www.pwc.com/gx/en/paying-taxes/assets/pwc-paying-taxes-2014.pdf

Radjou, N., Prabhu, J., Ahuja, S., and Roberts, K. (2012). *Jugaad Innovation: Think Frugal, Be Flexible, Generate Breakthrough Growth*. San Francisco, CA: Jossey-Bass.

Rice, X. (2012). "Africa: Lessons from Lagos." *Financial Times*. Retrieved from http://www.ft.com/intl/cms/s/0/8b24d40a-c064-11e1-982d 00144feabdc0.html?siteedition=intl#axzz3Qcq7PRqQ

Rice, X. (2013). "Internet Sales Flourish in Nigeria." *Financial Times*. Retrieved from http://www.ft.com/intl/cms/s/0/3f455b7e-b1bb-11e2-9315-00144feabdc0.html#axzz3PlSJq45m

Ryan, F. (2014). "A New Frontier: Africa's 'Explosive' Homebrew Market." *Financial Times*. Retrieved from http://blogs.ft.com/beyond-brics/2014/05/23/a-new-frontier-africas-explosive-homebrew-market/

Smith, D. (2013). "Rwanda Strikes 4G Internet Deal with South Korean Telecoms Firm." *The Guardian*. Retrieved from http://www.theguardian.com/world/2013/jun/11/rwanda-4g-internet-south-korea

Sonne, P., Maylie, D., and Hinshaw, D. (2013). "With West Flat, Big Brewers Peddle Cheap Beer in Africa." *Wall Street Journal*. Retrieved from http://www.wsj.com/articles/SB10001424127887324034804578348533702226420

The Economist. (2010a). "First Break All the Rules." *The Economist*. Retrieved from http://www.economist.com/node/15879359

The Economist. (2010b). "Security for Shillings." *The Economist*. Retrieved from http://www.economist.com/node/15663856

The Economist. (2011). "A Rare Good Man." *The Economist*. Retrieved from http://www.economist.com/node/18652563

The Economist. (2012a). "A Glass Half-Full." *The Economist*. Retrieved from http://www.economist.com/node/21551494

The Economist. (2012b). "Angels in Lagos." *The Economist*. Retrieved from http://www.economist.com/blogs/baobab/2012/10/nigerias-entrepreneurs

The Economist. (2012c). "From Lumps to Lager." *The Economist*. Retrieved from http://www.economist.com/node/21551092

The Economist. (2012d). "Upwardly Mobile." *The Economist*. Retrieved from http://www.economist.com/node/21560912

The Economist. (2013). "The Next Frontier." Retrieved from http://www.economist.com/news/business/21571889-technology-companies-have-their-eye-africa-ibm-leading-way-next-frontier

The Economist. (2014a). "Africa's Testing Ground." *The Economist*. Retrieved from http://www.economist.com/news/business/21613341-make-it-big-africa-business-must-succeed-nigeria-continents-largest-market-no

The Economist. (2014b). "On the Rise." *The Economist*. Retrieved from http://www.economist.com/news/middle-east-and-africa/21611112-scientific-research-africa-gathering-momentum-rise

The Economist. (2014c). "Rocket Machine." *The Economist*. Retrieved from http://www.economist.com/news/special-report/21593586-how-build-companies-kit-rocket-machine

The Economist. (2014d). "Slim SIMS." *The Economist*. Retrieved from http://www.economist.com/blogs/baobab/2014/09/disrupting-mobile-banking-kenya

The Economist. (2014e). "The Beer Frontier." *The Economist*. Retrieved from http://www.economist.com/news/business/21602999-long-established-african-firm-went-global-only-find-fastest-growing-market-was-its

The Economist. (2015). "Unblocking the Pipes." *The Economist*. Retrieved from http://www.economist.com/news/leaders/21640349-africa-needs-lot-capital-private-equity-offers-lessons-how-get-it-there-unblocking

The Economist Intelligence Unit. (2013). "Democracy Index 2013: Democracy in Limbo." Retrieved from http://www.ihsnews.net/wp-content/uploads/2014/06/Democracy_Index_2013_WEB-2.pdf

Topping, A. (2014). "Rwanda's women make strides towards equality 20 years after the genocide." The Guardian. Retrieved from http://www.theguardian.com/global-development/2014/apr/07/rwanda-women-empowered-impoverished

United Nations Conference on Trade and Development (UNCTAD). (2014). *World Investment Report 2014*. UNCTAD. Retrieved from http://unctad.org/en/publicationslibrary/wir2014_en.pdf

United Nations Department of Economic and Social Affairs (UNDESA). (2013). *World Population Prospects: The 2012 Revision*. UNDESA. Retrieved from http://esa.un.org/wpp/

UNESCO. (2014). "Africa's Minds: Build a Better Future." Retrieved from http://unesdoc.unesco.org/images/0022/002278/227858e.pdf

UN Habitat. (2014). "The State of African Cities 2014." Retrieved from http://unhabitat.org/the-state-of-african-cities-2014/

Vogt, H. (2015). "Making Change: Mobile Pay in Africa." *Wall Street Journal*. Retrieved from http://www.wsj.com/articles/making-change-mobile-pay-in-africa-1420156199

Walt, V. (2014). "Lagos, Nigeria: Africa's Big Apple." *Fortune*. Retrieved from http://fortune.com/2014/06/12/lagos-nigeria-big-apple/

Ware, G. (2013). "The Rise of Africa's B-brands." *The Africa Report*. Retrieved from http://www.theafricareport.com/North-Africa/the-rise-of-africas-b-brands.html

World Bank. (2014a). *Doing Business 2015: Going Beyond Efficiency*. Washington, DC. Retrieved from http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Annual-Reports/English/DB15-Chapters/DB15-Report-Overview.pdf

World Bank. (2014b). *Rwanda Overview*. Retrieved from http://www.worldbank.org/en/country/rwanda/overview

World Bank and African Development Bank. (2012). *The Transformational Use of Information and Communication Technologies in Africa*. Retrieved from http://www.infodev.org/infodev-files/resource/InfodevDocuments_1162.pdf