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WIDER Working Paper 2017/86

Prospects for information and communications technology-enabled services in Kenya

The case of the mobile money transfer industry

Dianah Ngui Muchai¹ and Peter Kimuyu²

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Abstract: The mobile money transfer industry has been the most successful information and communications technology-enabled service in Kenya, having recorded an exponential growth relative to its neighbours within the East Africa region. This could be attributed to Kenya's status as a leading commercial and logistics hub in the region, coupled with the competitive strengths of smaller regional peers such as Rwanda, providing a unique opportunity to expand the industry's services and maximize the economies of scale required for its success and expansion. This can be achieved if Kenya identifies its market niche, generates investment prospects, and addresses the accompanying risks.

Keywords: information and communications-technology-enabled services, prospects, mobile money, Kenya

JEL classification: C19, E42, L86, L88, N27, O55

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1 Background

Kenya is the largest economy in East Africa, with a gross domestic product (GDP) of US\$55 billion and gross national income (GNI) per capita of US\$1,190 (World Bank 2014). It is also the most diversified when we compare the ratio of agriculture to other sectors. Services form a small but fast-growing sector of the economy. For instance, financial services account for 4.8 per cent, education 3.5 per cent, and health 1.9 per cent. However, national income and export revenue are dominated by agriculture. Agriculture accounts for roughly 25 per cent of GDP, and over 51.4 per cent of export revenues (ROK 2014a). Over the last decade, Kenya has experienced tremendous growth in information and communication technologies (ICT), which have become a major driver of economic growth (ROK 2015). Since 2011, Kenya’s economy has grown at an annual average of 5.46 per cent, with the ICT sector contributing approximately 11.8 per cent of GDP growth (ROK 2016). The value of ICT output has increased over the years, amounting to KSh280 million in 2015 (ROK 2016). This growth can be ascribed to the embrace of technology by sectors such as finance, health, education, agriculture, and government, which use ICT for the distribution of information and the improvement of service delivery (Ogutu 2015).

Kenya has shown that it has the potential to become a global leader in ICT services. While Africa’s Internet contribution to GDP is low at 1.1 per cent, Kenya leads the continent at 2.9 per cent—ahead of South Africa, Tanzania, Nigeria, and Ethiopia, and just behind Senegal at 3.3 per cent (McKinsey Global Institute 2013). In addition to contributing to GDP, ICT enables innovation, production, and efficiency gains across several sectors that are core to Kenya’s economic growth. For instance, ICT services-led innovations such as M-PESA, the pioneering mobile money platform, have led to financial inclusion (Akamanzi et al. 2016). Table 1 shows the International Telecommunications Union ICT Development Index for 2016.

Table 1: ICT Development Index global rankings 2016

Economy	ICT access	ICT use	ICT skills	Overall score	Regional (Africa) ranking
Kenya	3.44 (133)	2.05 (117)	3.76 (133)	2.99 (129)	9
Uganda	2.37 (166)	1.27 (141)	2.43 (160)	1.94 (157)	23
Tanzania	2.65 (158)	0.30 (172)	2.33 (162)	1.65 (167)	31
Rwanda	2.65 (159)	1.47(136)	2.42 (161)	2.13 (150)	20
Ethiopia	2.11 (170)	0.82 (158)	1.71 (172)	1.51 (169)	33
Mozambique	2.90 (1458)	0.62 (164)	1.71 (171)	1.75 (163)	28
Ghana	4.74 (105)	3.03 (103)	4.44 (120)	3.99 (112)	6
Senegal	3.59 (132)	1.64 (133)	2.17 (160)	2.53 (141)	15
South Africa	5.46 (90)	4.00 (79)	6.23 (79)	5.03 (88)	3

The values in parentheses indicate global rankings.

Source: ITU (2016).

Kenya’s overall ranking within the African region as measured by the International Telecommunications Union ICT Development Index is higher compared with Uganda, Tanzania, Rwanda, and Ethiopia. Globally, it was ranked 129th in 2016—down slightly from 126th in 2010—and ninth in sub-Saharan Africa. The table shows that in sub-Saharan Africa, Kenya has the highest competency to use ICT efficiently, a result of appropriate skills, the highest accessibility of ICT infrastructure, and the highest level of IT use (ITU 2015b, 2016). Although significant differences

can be identified between the three subindices, the change in ICT use is more dynamic due to rapid growth in fixed and mobile broadband connectivity. The average growth of ICT use in Kenya was 3.4 points between 2010 and 2016.

The government of Kenya has emphasized universal access to ICT as a main objective of Vision 2030, the economic blueprint aimed at transforming Kenya from a developing country into a middle-income country (ROK 2014b). Developments in ICT and their business applications, together with the globalization of the world economy, have led to a rapid internationalization of ICT-enabled services (ITES) and business process outsourcing (BPO) (ROK 2014b). ITES is a form of subcontracted service that arose due to the involvement of ICT in numerous fields, including among others banking and finance, telecommunications, and insurance (Vaidyanathan 2008). ITES use ICT as an enabler for designing services, harmonizing service distribution, and providing services (Vaidyanathan 2008). BPO is the subletting of a particular business undertaking to a third-party service provider. Organizations give their ICT-intensive business activities to external service providers in order to benefit from the fast-growing global telecommunications infrastructure (Vaidyanathan 2008). BPO is common in call centres, human resources, accounting, and payroll. The terms BPO and ITES will be used interchangeably in this paper.

The ICT sector is largely made up of the postal and telecommunications sector, which mainly comprises mobile, fixed-line, and Internet/data services (ROK 2015). The BPO/ITES sector in Kenya is under the jurisdiction of the ICT Board and the Ministry of Information and Communications. Consequently, BPO/ITES is classified under the ICT sector. The BPO/ITES sector is not currently among the sectors classified as main sources of economic growth in Kenya. The Communications Authority of Kenya indicates that the first BPO centre was approved in 2004, and media reports suggest that the first BPO call centre was established in 2005 (Isenberg 2009). The government singled out BPO as part of Vision 2030, signifying the potential of the BPO/ITES sector in the country. In addition, the government has put strategies in place to enhance the BPO/ITES sector, including a favourable legal framework and funding efforts, a sign of their confidence in increased growth.

The purpose of this paper therefore is to provide an analysis of the ITES industry, specifically the mobile money transfer (MMT) industry's potential in terms of market opportunities and its development impact in terms of jobs, income generation, and productivity growth. The study is organized as follows. Section one has provided background information. Section two analyses the development of the ITES industry in Kenya, discussing policies and their outcomes. The status of the BPO/ITES industry is also discussed. Section three presents the MMT industry and discusses its operations and policy perspectives. Section four discusses the potential and development impact of MMT, including a synopsis of the literature on the industry's country-level development impact. Section five presents the obstacles and opportunities for MMT arising from changes in technology. Section six presents the conclusion of the study.

2 Development of the industry: policies and outcomes in the ICT-enabled services industry

The first national ICT policy, published in 2006, visualized Kenya as a successful ICT-driven society, with a mission to improve Kenyans' livelihoods by guaranteeing that ICT services would be accessible, efficient, trustworthy, and affordable (Waema and Ndung'u 2012). The government embarked on the reinforcement of ICT as a driver for important sectors and a way of growing technology entrepreneurs and businesses as strategic pillars (Wausi et al. 2013). However, the

enlargement of subsectors such as BPO/ITES was challenged by unbalanced ICT access among remote and underserved communities in Kenya (Wausi et al. 2013).

The ITES/BPO sector was identified as one of the six key economic sectors in Vision 2030 (ROK 2007). This aimed to diversify, and to move away from a dependence on tourism and tea and coffee production. Vision 2030 outlined strategies to penetrate the global outsourcing market in order to position the country as the top African BPO destination. The strategic pursuits included an international information technology supplier base, multinational corporations and foreign BPO, local champions, and integrated value propositions (Thugge et al. 2009). As a result, the BPO and Contact Centre Society was formed in March 2007. This was the BPO cluster's first 'institution for collaboration'. The Kenya ICT Board (KICTB), formed by presidential directive in 2007, was the second such institution for collaboration. According to Waema and Ndung'u (2012), its aim was to encourage the growth of ICT in the country, specifically BPO and ITES, guiding the government on ICT concerns alongside the Directorate of e-Government in regard to the enactment of e-governance systems. In 2008 the Kenyan BPO Value Proposition was established and marketed at BPO conferences and trade shows all over the world (Mann and Graham 2016). Following this, the government introduced programmes to mainstream ICT in government operations. This included providing satisfactory ICT education and training, reducing taxes on computer software and hardware, and revising the legal framework to inspire the adoption and use of e-commerce and e-government services (Ochieng' et al. 2011; ROK 2004). For instance, the private sector partnered with the government to collect government revenue through mobile platforms such as e-Citizen and Ejiji Pay (Ogutu 2015). The government also launched local-government service delivery centres known as Huduma Centres to broaden Internet access (ROK 2014b). The government also proposed to adopt ICT-enabled services to improve effective delivery from a customer support perspective. To this end the government adopted the use of customer relationship management technology under a public-private partnership, and sought to transform 10,000 public servants into customer contact agents (ROK 2014b).

During the period 2007 to 2010, the government offered subsidies to firms in the BPO sector in an attempt to encourage the development of the sector. However, according to Chumo (2015), only a third of companies took advantage of the offer, which reduced their bandwidth costs by half, resulting in the expansion of their business. The government was also in the process of establishing Konza Technology Centre, a BPO park at a location in Athi River, which was projected to generate 20,000 direct jobs and contribute KSh10 billion to GDP (Mann and Graham 2016).

According to Graham and Waema (2014), the concentration on international BPO work was not as effective as initially intended. The few ITES exporters were predominantly small local firms with negligible exports. This was attributed to the strategy of not focusing on or developing local clients first before embarking on the international market. This would have been important in encouraging large-scale companies in addition to developing depth in the industry.

To enable the advancement of an ICT-enabled economy, a strong ICT infrastructure is necessary (ROK 2014b). Kenya has successfully provided a competent and well-regulated ICT infrastructure, and constantly updates knowledge that will also improve the penetration of ICT in Kenya (ROK 2014b). The lowering of interconnection and communication costs has been one of the important enablers of the ICT-enabled sector (KICTB 2013). UNESCO (2015: 5) notes that 'affordable and reliable power, easy and affordable access to requisite technology and capital goods, a supportive regulatory environment, programmes for skills development, and an ability to make trusted and verifiable payments' are important enablers for a thriving ITES industry.

2.1 The state of the BPO/ITES industry

The BPO industry has been growing steadily since the first international call centre opened in 2005. Currently there are 50 BPO/ITES firms operating in Kenya, providing various services such as data processing, digitization, transcription, and call centres. A growing number of firms offer high-end services such as software development, programming, research and development, and finance and accounting services. The domestic call centre space has been expanding, with large telecoms and banks setting up captive call centres to handle customer service enquiries. This is unlike the situation in Senegal, where there were only nine call centres in 2016, with three call centres accounting for 70 per cent of the market. In South Africa, BPO/call centres are growing fast, having increased from 185 call centres in 1997 to 1,500 centres in 2012 (Pandy and Rogerson 2012).

Kenya is among the top 55 countries based on corporate units, current remote services activity, and government initiatives to encourage the sector (A.T. Kearney 2016) (see Table 2).

Table 2: Industry leaders and African competitors 2016

	Financial attractiveness	People skills and availability	Business environment	Overall score	Ranking
India	3.22	2.55	1.19	6.96	1
China	2.28	2.71	1.51	6.49	2
Malaysia	2.75	1.42	1.89	6.05	3
Philippines	3.17	1.43	1.29	5.88	7
Ghana	3.27	0.85	1.07	5.19	29
Mauritius	2.55	0.94	1.65	5.17	30
Morocco	2.80	0.93	1.34	5.07	34
Tunisia	3.04	0.82	1.18	5.05	38
Kenya	3.06	0.86	1.11	5.03	39
Senegal	3.06	0.70	1.13	4.89	45
South Africa	2.20	1.08	1.50	4.77	48

Source: A.T. Kearney (2016).

Kenya lies in 39th position, being a new entrant and the only East African country in the 2016 Global Services Location Index. It has the same financial attractiveness (availability of infrastructure) as Senegal, which is not far behind the industry leaders India and the Philippines, and well ahead of China and Malaysia. This might be due to Kenya's remarkable development in ICT thanks to the establishment of reliable optic fibre cables for businesses (see Table 3). The greatest weakness appears to be in the quality and quantity of human resources, which are just ahead of Senegal (Table 2).

Kenya's ranking is higher than that of Senegal in relation to telecommunications infrastructure and human resources as measured by the 2016 International Telecommunications Union ICT Development Index. Kenya was ranked 129th in 2016, higher than Senegal (141st) but lower than Ghana (112th), China (81st), the Philippines (107th), and Malaysia (61st) (ITU 2016). With regard to business environment, Kenya is behind the African countries with the exception of Ghana. Research by McKinsey and Company (2009) found that Kenya has lost out to its competitors in the outsourcing industry since it has not identified a market niche, created investment opportunities, or addressed associated risks. Many local firms have grown by serving customers in Kenya and the neighbouring countries of Uganda and Tanzania (A.T. Kearney 2016).

Table 3: Mobile phone price, broadband price, and subscriptions per 100 inhabitants in 2015

Economy	Mobile phone price	Mobile phone price (USD)	Mobile broadband price prepaid	Mobile broadband post-paid	Mobile phone subscriptions per 100 inhabitants
Kenya	3.36	3.62	5.08	5.08	81
Uganda	10.93	6.10	11.05	19.34	50
Tanzania	8.68	6.65	9.82	5.89	76
Rwanda	10.00	5.85	2.38	14.03	71
Ethiopia	6.74	3.09	21.05	21.05	43
Mozambique	16.20	8.10	5.00	12.23	74
Ghana	2.16	2.87	3.96	3.96	130
Senegal	15.82	13.84	9.12	9.66	100
South Africa	1.25	7.07	1.37	1.18	159

Prices as a percentage of GNI.

Source: ITU (2016).

Many companies have left the industry, despite persistent expectations around BPO (see e.g., The Economist 2010; Fildes 2010; Wambugu 2010). The companies that have remained operational engage in less attractive contracts, and have altered their work from that which was initially intended (Free 2015). For example, KenCall, Horizon, Techno Brain, Direct Channel, Spanco Raps, and Gorilla BPO now carry out work acquired from the local and East African regional market, rather than the international clients that were their original focus (Free 2015). Nonetheless, to varying degrees, BPO and call centres remain promising sources of future entry-level youth employment in Kenya, South Africa, and Ghana (IYF 2013). In Nairobi, BPO is largely regarded as low-skilled work that can fundamentally be done by anybody (Free 2015). Unlike many BPO operations, which are presumed to employ many people at one time, Nairobi's BPO call centres have been entirely small-scale, with the number of agents working during any given period ranging from 10 to a few hundred (Free 2015).

The overall goal for the BPO sector up to 2012 was the generation of 7,500 direct jobs and a GDP contribution of KSh10 billion (ROK 2007). The growth experienced in Kenya's BPO industry included contributions to total GDP, up from less than 0.01 per cent in 2008 to six per cent in 2012 (Wausi et al. 2013). In total, 7,000 jobs were generated by mid-2012 (ROK 2012). The government attributed this to 'increased marketing of the country, reduction in telecommunication costs, and subsidised broadband for local BPO operators' (Waema and Ndung'u 2012: 12). The South African call centre sector has grown by approximately eight per cent per year since 2003, directly employing over 54,000 people and contributing 0.95 per cent to South Africa's GDP (Vere and Mautsa 2013). Currently, the sector employs at least 210,000, with many companies outsourcing their call centre operations to South Africa (A.T. Kearney 2016). South Africa's business environment and judicial system offer great security to business investors (A.T. Kearney 2016).

The government envisions call centres as a major source of employment in data-oriented BPO for jobless graduates and school leavers (Free 2015). Waema (2009) notes that in the BPO industry, the lowest employment age is 18, with a minimum qualification of a certificate, subject to the agent's operations. The BPO sector employs more females by 20 per cent in call centres, and more males by 20 per cent in professional positions (Waema 2009). Free (2015) observes that those with lower levels of education—predominantly those with a secondary-school education—are more dedicated, and are not disposed to leave for better jobs. With regard to skills analysis, the Ministry of Information and Communications (MOIC 2010) notes the skills required for BPO-ITES employment as computer skills, knowledge of specializations in particular industries such as

medicine and law, communication skills, cultural sensitivity, customer interaction, data skills, and business ethics and organizational culture. An assessment of IT skills by Wausi et al. (2013) revealed that there was a gap in software development and project management skills.

Basic monthly salaries as of November 2011 were US\$300–US\$500 including incentives for voice profile agents, and US\$500–US\$1,000 including performance-related pay for group leaders (Wausi et al. 2013). Free (2015) found that in Kenya, an agent’s starting salary ranged between KSh15,000 and KSh25,000 per month (US\$150 and US\$250). The bonuses earned by agents from sales transactions are the primary attraction of BPO work. Nevertheless, the meagre earnings have led to graduates leaving their companies in pursuit of better opportunities and pay in rival companies. This has made companies within the BPO sector struggle to maintain their staff (Free 2015).

The entry of optic fibre cables made international and in-country connections cheaper and more common (Mann and Graham 2016). This in turn enlarged the demand for ICT access and services, and encouraged the creation of additional products and services (KICTB 2013). One such product was mobile phone-facilitated services. The Communications Authority of Kenya indicated a growth of 26.4 million mobile phone subscribers, crossing the 30 million mark of active mobile phone numbers by December 2012 (CAK 2012-Q1). The McKinsey Global Institute (2013) indicated that 95 per cent of Kenyans had Internet-enabled phones, with 31 per cent owning smartphones. The government reoriented its funding and policymaking attention to software development and other high-value products, due to the incredible infiltration of mobile connectivity (Mann and Graham 2016). Most notable were Safaricom’s mobile money platform M-PESA, and the disaster response crowdsourcing tool Ushahidi (Mann and Graham 2016). From an operational point of view, the government started to understand the potential of ICT automation for the centralization of control over government budgets and decreasing corruption and waste. For example, the Kenya Revenue Authority declared that all medium- and large-scale taxpayers would file and pay their taxes electronically in 2013 (Mann and Graham 2016). In July 2011, the Kenyan government launched the Open Data Initiative to offer transparency and open a development dialogue between citizens and the public sector (KICTB 2013). Similarly, tax evaders in the informal economy were to be identified through the digital tracking of M-PESA and bank transfers (Omondi and Juma 2013).

The most successful ITES/BPO service in Kenya is MMT, the flagship product being the M-PESA service from Safaricom Kenya Ltd. As will be observed in this paper, MMT services have contributed both directly and indirectly to boosting economic growth, specifically by facilitating payments and trade, and by creating significant incomes for service providers.

3 The development of the MMT industry

Mobile phones are the most widespread technology, with half of the world’s population having at least one mobile subscription in 2014 (GSMA 2015), and total mobile subscriptions reaching more than seven billion at end of 2015 (ITU 2015a). In Kenya, mobile phone subscriptions were 33.6 million with a capacity of 65 million in 2014 (ROK 2015). However, mobile phone capacity declined by 3.5 per cent to 62.8 million in 2015, due to the exit of Essar (YU) Ltd (ROK 2016). Mobile phone subscriptions currently stand at 37.7 million with a penetration rate of 87.7 per cent, proving that the mobile phone is becoming a significant tool in changing lives (CAK 2016-Q2; ROK 2016). The growth in subscribers led to an expansion in used mobile capacity from 51.7 per cent in 2014 to 60.1 per cent in 2015 (ROK 2016).

Table 3 shows mobile phone prices, broadband prices and subscriptions per 100 inhabitants. Compared with other countries in the East African region, Kenya has the highest number of mobile phone subscriptions per 100 inhabitants. This can be attributed to the country having the most affordable mobile phone price and the cheapest mobile broadband services, which have increased the uptake of ICT services, particularly mobile money services. This is in spite of Kenya having a low GNI per capita (less than US\$7,000) compared with South Africa, which has a GNI per capita of above US\$7,000. This indicates that the affordability of mobile phone services does not depend exclusively on a country's economic development, but also on competition, efficient regulation, policymaking, and private initiatives (ITU 2015a). The favourable regulatory regime has been of benefit to the ICT sector in general and mobile money in particular (Peake 2013). The Ministry of Information and Communications has taken the view that regulation should be introduced after the markets have been allowed to grow and novelty has been encouraged (Peake 2013). A good example was the introduction of a comprehensive reform of communications legislation in 2008, by which time the mobile sector had already grown rapidly (Peake 2013).

The availability of mobile devices offers a distribution technology for mobile financial services for the unbanked (Macmillan 2016). The initial impetus for mobile money services was to enable unbanked persons to electronically transfer funds that they had previously been transferring physically, bringing people from the cash-based 'unbanked economy' into modern systems (Macmillan 2016). The convergence of telecommunications and banking services generated opportunities for the development of mobile commerce, specifically mobile banking and MMT, which have made vast contributions to economic development (Vaughan 2007). According to the Central Bank of Kenya (2009), most large banks have made considerable investments in mobile phone banking. Among the numerous non-banks competing for positions in this fast-growing space were mobile network carriers, credit card processors, and online personal finance services that allowed customers to have their accounts on a single website (Deloitte 2010). The mobile channel permits banks to give their clientele features not available online, such as remote cheque deposits and person-to-person payments (Deloitte 2010).

The development of MMT is generating more incentives for banks to serve customers in an improved, well-organized way, thus altering the economics of banking (Deloitte 2010). MMT is an innovation to transmit money using the ICT infrastructure of mobile network operators (Mbiti and Weil 2011). MMT facilitates payments using a mobile phone, where the value can be stored in a mobile account before and after the transaction. MMT service subscribers reached 26.8 million in 2015, representing a penetration rate of 60.6 per cent of the total population (ROK 2016). MMT is appropriate for the rural poor, who are frequently unreached by the banking system. It has also obviated most rural-urban movement, especially during month ends, thereby reducing remittance-related costs. It facilitates trade, making it simpler for people to purchase goods and services, and at the same time reducing transaction costs and the risks of loss inherent in handling cash. In 2015 the mobile money system transferred KSh2,816 billion (representing 45.2 per cent of Kenya's GDP), compared with KSh2,371.8 billion (43.9 per cent of GDP) in 2014 (ROK 2016). Kenya has been able to keep up with the fast-growing technology and is in the lead with regard to MMT (ROK 2015).

MMT is offered by several service providers. The main mobile network operators offering these services, namely M-PESA, Airtel Money, and Orange Money, are Safaricom, Airtel, and Telkom Kenya (operating under the Orange brand) respectively. Finserve (Equitel Money), Mobile Pay (which launched a service under the name Tangaza), and Zioncell/Mobile Decisioning (MoDe) were also granted mobile virtual network operator licences in May 2014 (Muthiora 2015). By December 2015 the mobile money market had roughly 37.7 million users; Safaricom's M-PESA was ranked the biggest, with 24.4 million registered customers (CAK 2016-Q2). Safaricom Ltd,

Airtel, Orange Kenya, and Finserve Africa Ltd recorded market shares of 64.7 per cent, 19.2 per cent, 12.4 per cent, and 3.7 per cent respectively in December 2015 (CAK 2016-Q2).

3.1 The structure of MMT

Mobile money providers can be regarded as payment service suppliers or e-money issuers, according to the National Payment Systems (NPS) Act. Customer resources are secluded from the service provider's resources, are not allowed to be advanced as a loan or invested, and must be held in confidence with a 'highly' ranked controlled bank (Muthiora 2015). Agents, directly supervised by service providers, are appointed to registered customers, and offer cash-in and cash-out services (Muthiora 2015). These agents not only maintain e-float balances on their mobile phones and cash on their premises, but also accept deposits/withdrawals of cash from customers who have registered as facility users. To enable agents to prefund their 'float' accounts, mobile money is changed into electronic values, with a corresponding currency amount kept in a trust account (Muthiora 2015). For bulk customers (e.g., public agencies making social transfers), the trust account is prefunded to cover the transfers. The mobile money system and trust account balances are reconciled every day (Muthiora 2015).

3.2 Policy perspectives on MMT services

The NPS Act was operationalized to enable secure online disbursements by assisting multiple financial institutions to transmit electronically and simplify the handling of payments. The NPS regulations were published in August 2014 (Muthiora 2015). This provided a strong foundation for new innovations in mobile phone financial services and the extension of national and regional payment structures. Mobile money services can be offered by banks, non-banks, and mobile operators. While the NPS guidelines do not require mobile money businesses to operate under a distinct authorized body, mobile operators should work under different business entities. With the guidelines not being very rigid, and with investment incentives being offered to service providers by the Central Bank, originality and development have been encouraged in the sector, while the solidity and reliability of the financial sector has been maintained (Muthiora 2015).

To ensure the reliability of mobile money services, service providers must establish acceptable operative and transparent governance measures (Muthiora 2015). Furthermore, it is mandatory for providers to reveal to clients and the Central Bank any alterations in rates, terms, conditions, or charges for the service no less than seven days before they come into operation (Muthiora 2015).

4 The prospects and development impact of MMT

MMT in Kenya has grown remarkably, becoming a major spur for economic growth and social development (Financial Sector Regulators Forum 2015).

Although some of MMT's initial achievements could be credited to an exceptionally favourable environment for mobile payments—including resilient customer need, a friendly regulatory environment, backing from banks, and strong brand awareness for Safaricom—the structure of the distribution network has also played a significant role in the remarkable growth of MMT, notably M-PESA and the safety of the scheme (Muthiora 2015). In East Africa, Kenya has the highest share of adults with a mobile money account at 58 per cent, followed by Somalia, Tanzania,

and Uganda with roughly 35 per cent (Demirguc-Kunt et al. 2015). Table 4 shows how mobile phone financial services have grown since 2010.

Table 4: Mobile phone financial services growth

	2010	2011	2012	2013	2014	2015
Total number of agents	39,449	50,471	76,912	113,130	123,703	143,946
Mobile money transfer accounts ('000)	10,615	17,396	19,319	26,016	26,023	26,753
Total number of transactions (millions)	311.0	433.0	575.0	733.0	911.0	1,223.4
Total value transacted (KSh billion)	732.2	1,169	1,544	1,902	2,372	2,816
Average value per transaction (KSh)	2,354.0	2,700.0	2,672.0	2,594.0	2,604.0	2,301.8
Total deposits through agents (KSh billion)	391	566	811	1,033	1,269	1,347

Sources: authors' compilation based on data from ROK (2015, 2016) and CAK (2016-Q2).

The use of MMT has been increasing since 2010. The cash deposits made through mobile money agents increased to KSh1,347 billion in 2015, up from KSh1,269 billion in 2014 (ROK 2015). The volume and value transacted increased from 911 million transactions valued at KSh2,371.8 billion in 2014 to 1,223.4 million transactions worth KSh2,816 billion in 2015, representing a 24.3 per cent and 34.3 per cent increase in volume and value respectively (ROK 2015). Overall in 2015 the value transacted increased by 18.7 per cent, representing 45.2 per cent of Kenya's GDP. The growth can be attributed to the introduction of cashless payments on public transport, aggressive marketing by service providers, and increased acceptance of the service by customers owing to its accessibility, cost-effectiveness, and safety. The number of agents increased by 16.4 per cent in 2015 compared with 9.4 per cent in 2014, and the number of MMT accounts increased by 0.03 per cent and 2.8 per cent in 2014 and 2015 respectively. A study by Jusilla (2015) found that Kenya was leading the use of mobile money, with an approximately 70 per cent usage rate, compared with Tanzania and Uganda at 20 per cent and 30 per cent respectively. Moreover, 50 per cent of companies were using mobile money in Kenya, compared with 40 per cent and 46 per cent in Uganda and Tanzania respectively.

Mobile money has also created jobs for numerous Kenyans, making a significant addition to the economy. In 2014, employment levels for MMT agents increased by 30.12 per cent to 121,924; the employment levels for telecommunications operators and Internet service providers increased by 9.4 per cent and 11.9 per cent to 6,201 and 6,237 respectively. The total number of active MMT agents stood at 143,946 in December 2015, up from 129,357 in June 2015 (CAK 2015-Q1; ROK 2016). Mbiti and Weil (2011), measuring employment using farm employment, non-farm employment, and self-employment, found that M-PESA adoption was related to a growth in employment.

There were 143,946 registered MMT agents in 2015. The three major employment sectors continued to be agriculture, forestry and fishing; manufacturing; and the wholesale and retail trade and repair of motor vehicles. These three sectors respectively accounted for 294,000, 269,000, and 230,700 private-sector jobs. However, the percentage change in employment from 2014 to 2015 was high in MMT at 16.4 per cent; agriculture, forestry and fishing, manufacturing, and the wholesale and retail trade and repair of motor vehicles respectively showed -1.2 per cent, 2.9 per cent, and 5.4 per cent. This demonstrates the potential of the MMT sector as far as boosting employment is concerned. ICT registered 103,800 employees, with a 6.7 percentage change in employment from 2014 to 2015. Nevertheless, McCaffrey et al. (2014) show that Kenyan mobile

cash agents earn the lowest commission at roughly KSh11,700 (US\$117) per month, followed by Tanzania at KSh12,600 (US\$126), with the best-paid agents being in Uganda (KSh13,600/US\$136). This might be due to the growth in the number of agents and increased competition for clients. It should be noted, however, that the agents are not wholly employed by mobile providers, but also engage in other activities such as retail trade, and perform their function as agents part-time. In addition, outlets serve as double service points for other mobile network operators within the country, which increases agents' average monthly income.

MMT serves as a partial substitute for the formal banking system. Preceding the introduction of mobile money, many Kenyans were excluded from modern financial services. The statistics on financial access before the launch of mobile money, notably M-PESA in Kenya in 2007, show that 38 per cent of people were financially excluded, i.e. did not use any form of financial service, whether formal, semi-formal, or informal (Steadman Group Research Division 2007). One of the factors that keep the poor stuck in poverty is insufficient and inaccessible financial services, which leave people unable to finance their education or health, start a business, or acquire tools to increase their productivity (Digital Undivide 2012). A study by Burgess and Pande (2005) found that rural poverty rates in India declined considerably due to rural banking expansion, which according to Pickens et al. (2009) was largely determined by increased access to credit. The enlargement of branchless banking in areas where opening a branch is costly has been enabled by mobile systems through the utilization of agents (Pickens et al. 2009).

Mobile money can accelerate access to formal financial services. In partnership with banks, mobile network operators have provided mobile financial services to rural and remote areas (Muthiora 2015). Furthermore, the excluded have been provided with opportunities through the extension of services such as M-PESA and mobile and agent banking (ROK 2014b). The launch of the first cardless cash machines in 2008 enabled both banked and unbanked M-PESA users to withdraw cash from Pesa Point cashpoints, successfully making the cashpoints into effective mobile money channels (Muthiora 2015).

The introduction of agent banking, and the increased association between mobile network operators and banks, has considerably expanded the banking business since 2010 (Muthiora 2015). Mobile money agents represent three quarters of total financial access points, and are most important in bringing financial access to the population (Ogutu 2015). According to the Central Bank of Kenya et al. (2016), 71.4 per cent of Kenyans use mobile money; only 17.4 per cent of the population is now financially excluded, and financial exclusion has more than halved since 2006. Mobile channel access has enabled digital entrepreneurs to monetize their ideas by influencing mobile technology (Muthiora 2015).

Researchers have also noted the potential of mobile money to affect savings. National savings are expected to increase from 14 per cent of GDP in 2007 to over 25 per cent in 2030 (ROK 2007). Mbiti and Weil (2011) observe that mobile money affects the economy directly through intensifying access to funds, and indirectly through increasing savings and banking charges. Mobile money offers an easy and secure platform for small savings to the majority of rural populations who have no access to formal financial services. Although the mobile money system does not offer interest, customers use their mobile money accounts as simple bank accounts to save money (Morawczynski and Pickens 2009). This could be attributed to some individuals' desire for safety, particularly when travelling or sending money upcountry (Vaughan 2007). It has reduced the risk of theft, since the cash being carried is invisible (Kesenwa et al. 2013). Furthermore, mobile money has consequences for privacy and autonomy because it is less visible than cash (World Bank 2012).

Apart from making money transactions flexible, fast, and cost-effective, mobile money has empowered the creation of businesses. For instance, Safaricom established a customer contact

centre with 1,200 seats, integrating a do-it-yourself (DIY) platform (Wausi et al. 2013). DIY technology is used in the M-PESA platform, where a machine-generated voice service gives the consumer guidance on how to operate their account or solve mobile application problems. These technologically supported services lead to customer call centres that function like BPO call centres, at the same time concentrating on local business from the technology side (Wausi et al. 2013).

Since the introduction of mobile money in 2007, Kenya has become a leading entrepreneurial power in Africa (USAID 2015). Kenya scored high in high-tech transfer and networking in the 2016 Entrepreneurship Index, ahead of any other East African country (Acs et al. 2016). Companies are generally quite willing to adopt new technologies into their practices, and ‘opportunity-driven entrepreneurship’ has gained traction ‘as more people embrace it for self-development’ (Oigara 2015). A good example is Jana, a mobile microbusiness, where mobile devices are used to assign tasks to workers, and payment is made through airtime or mobile money (ITU 2013). There has also been a proliferation of mobile start-ups, and even mobile incubators such as mLab and iHub that use the services of mobile network operators, including mobile money. Entrepreneurship has been encouraged by strong and visible government support for infrastructure, incubators, and policy reform (Akamanzi et al. 2016). The strong government backing has established the internationally recognized term ‘Silicon Savannah’ (Bloomberg 2012). Start-up companies see mobile money as a cost-effective payment method for their services (Muthiora 2015).

Through mobile money, integrations with existing products and innovations of new products have been developed. Kenya scored high in the 2016 Global Innovation Index, ahead of any other East African country (Dutta et al. 2016). Kenyan customers have rapidly adopted new Internet-based services specifically tailored to address some of the local competitive deficiencies and problems. For example, M-PESA’s success was due to its ability to provide fast and secure cash transfers even to remote villages (Runde 2015). Building on that success, more start-ups have been spawned to address payment-related issues, such as school fees transactions or public transport payments (The Economist 2012). The World Bank (2012) observed that insurance, credit, and savings services were developing within established mobile money systems. For example, in 2009 Syngenta Foundation and UAP Insurance, in partnership with Safaricom, started Kilimo Salama, an insurance product that uses M-PESA to make payments to smallholder farmers whose crops fail due to excess rain or drought. Mobile money providers have collaborated with commercial banks such as Equity Bank, Commercial Bank of Africa, I&M Bank, Kenya Commercial Bank, Barclays, and Co-operative Bank to offer mobile-based products. For instance, in 2011 a ‘pay online’ prepaid virtual credit card financed via Airtel mobile money accounts was launched by Airtel Kenya in co-operation with MasterCard and Standard Chartered Bank (Muthiora 2015). Likewise, in 2012 Safaricom teamed up with the Commercial Bank of Africa to launch M-Shwari, a mobile service that offers micro savings accounts and credit. The total value of deposits organized through M-Shwari as of February 2014 was more than KSh24 billion (US\$26 million) (Muthiora 2015), with more than 890,000 loans being given (Ngigi 2014). Customers can also purchase an affordable home solar system using the M-KOPA system, which utilizes machine-to-machine communication and mobile payments (World Bank 2012). These are examples of how ICT services are seizing opportunities and customer readiness to make a real economic impact, accelerating the growth of Kenya’s service sector through the adoption of ICT services (Akamanzi et al. 2016).

Many small companies depend on mobile money for almost all their transactions, or provide a service that is derived from the platform itself. Many have adopted M-PESA to streamline transactions with suppliers and customers. Digital transfers in the sale of agricultural produce have particularly gained ground in Kenya, Tanzania, and Uganda. For instance, in Kenya, 37 per cent of recipients receive payments into a mobile money account, compared with 24 per cent and 15 per cent in Tanzania and Uganda respectively (Demirguc-Kunt et al. 2015). Market traders can

now transfer their money to the supplier, who can then deliver the goods to their premises (Ng’weno and Bill and Melinda Gates Foundation 2010). Mobile money encourages the growth of small-scale firms, mainly due to the role it plays in promoting the movement of money across the country (see Plyler et al. 2010). Table 5 shows annual growth in average labour productivity for various sectors.

Table 5: Annual changes (growth) in average labour productivity

	2011	2012	2013	2014	2015
MMT	0.09	-0.13	-0.13	0.12	0.15
Agriculture, forestry, and fishing	0.03	0.01	0.04	0.06	0.05
Manufacturing	0.04	-0.01	0.02	0.003	0.01
Wholesale and retail trade and repairs	0.03	0.03	0.01	0.04	0.01
Information and communications	0.18	-0.04	0.05	0.07	0.01

Source: authors’ calculations based on data from ROK (2015, 2016).

Table 5 shows that average labour productivity growth has been erratic, dropping inconsistently for all sectors in 2012 and 2013. This might be attributed to slowed confidence due to the 2013 general elections. Average labour productivity growth was high in MMT in 2015 compared with the other sectors, which registered a growth rate of less than five per cent. Average labour productivity growth in MMT is essential for enhancing the economic growth of the country.

Mobile money eases trade by empowering users to purchase goods and services directly from businesses and service providers (Runde 2015). This in turn has reduced corruption by decreasing the necessity to operate a cash-only economy (Runde 2015). For example, local authorities in the developed world have embraced ICT to serve a variety of ends, such as better delivery of services to citizens and improved interactions with business (WITSA 2003). The resulting benefits have been less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions (WITSA 2003). The influence of mobile money is expected to spread to the public sector through improved efficiency and reach. The adoption of mobile money by the government—for instance, in salary payments—would not only demonstrate its importance as a driver of the service all over the economy, but would also ‘improve the government’s ability to monitor financial flows, collect tax revenues, and reduce illicit activity’ (World Bank 2012: 65).

5 Obstacles and opportunities for MMT

Despite an increasing number of achievements, the mobile money industry faces numerous obstacles. The mobile money industry spans two distinct industries, finance and telecommunications, which have distinct business models. This implies that it faces by-laws emanating from two distinct sectors. Developing the required cross-sectoral partnerships in addition to connecting cultures and regulations may be challenging (World Bank 2012). By-laws are required not only to be exhaustive, but also to increase proportionately as mobile money grows.

Mobile money can enhance the national payments system by making available innovative ways to meet customers’ transaction requirements (Ndiwalana et al. 2010). The extent to which alternative ways are available and necessary is one of the factors that will determine the success of mobile money (World Bank 2012). Although mobile network operators and banks have constantly offered new and improved services, the demand from consumers and firms has not been sufficient to sustain them (World Bank 2012). This has led to the disappearance or dormancy of opportunities, causing huge losses to investors. While there seems to be an opportunity for market players to

invest, they must fully comprehend not only the needs, behaviours, and skills of the users, but also their level of adoption and their motivations and opinions regarding the use of money (see Donner and Tellez 2008). This would go far in contributing towards the success of mobile money.

Many service providers have been and/or are being hindered by legacy systems that destabilize the efficient growth of services. For instance, there may be substantial suspicion of formal financial services, which has tended to make people uncomfortable about parting with their money (see World Bank 2012). In such cases, a flawless and dependable value proposition that fits within societal and traditional practices should be created by the mobile money operators (World Bank 2012). This would help people to embrace the service being offered to them.

There are numerous opportunities for the MMT services industry to connect with health, agricultural, and financial inclusion goals. Kenya's challenges in areas such as security and property rights provide room for more business opportunities. However, this has been slowed by the lack of Internet access in the country, specifically in remote areas. Given similar challenges in surrounding countries, increasing Internet access in the region is likely to increase demand for such services.

MMT requires a certain standard of literacy, which could lead to the exclusion of the small but important segment of Kenyan society that is illiterate. For technology-oriented Kenyan firms, accessing highly skilled talent is a major cause for concern: the skills gap encompasses both the supply of adequately trained personnel for ICT firms and the demand for ICT services from a citizenry with a basic education (ROK 2013). KICTB (2011) observed that of the 27,000 ICT professionals in Kenya, 27 per cent worked in support functions, and 26 per cent as systems analysts and engineers, leaving a gap in the problem-solving and creative skills essential for developing innovative solutions. According to Wausi et al. (2013), the country has had a chance to improve the skills of its young people for developing ITES industries such as MMT. As a result of the discrepancy between the capabilities of the jobless and the skills requirements of prospective employers, a large percentage of qualified young people are likely to remain jobless for a long time (Wausi et al. 2013). To bridge the gap, there is a need for collaboration between mobile network operators and educational institutions to make sure that graduates' skills match the skills required to operate MMT services. Training should be provided in customer services such as how to win and retain the trust of customers, and how to manage liquidity with money and e-cash.

MMT could lead to a significant increase in money supply, undermining monetary policy. In 2012, Safaricom partnered with the Commercial Bank of Africa to launch M-Shwari, a mobile service that deals with micro savings accounts and credit. The total value of deposits mobilized through M-Shwari as of February 2014 was more than KSh24 billion (Muthiora 2015), with more than 890,000 loans disbursed (Ngigi 2014). Adam and Walker (2015) note that while the mobile money sector is enormously positive from the perspective of financial development, the same process risks undermining the efficacy of conventional systems of monetary control. Mobile money has the potential to impact negatively on demand for money and the money multiplier. The impact on the multiplier is unpredictable, because as people and banks switch away from cash they can move to things that affect either the top or the bottom of this ratio. If the money multiplier fluctuates unpredictably due to innovations—of which mobile money is just one—the strategy of setting reserve money to control inflation becomes difficult (Adam and Walker 2015). However, Adam and Walker (2015) argue that the influence of mobile money is highly likely to be positive and to improve rather than destabilize the effective application of monetary policy if countries adopt modern monetary frameworks.

6 Conclusion

As this paper has established, and as other researchers (such as Wausi et al. 2013) have noted, a precondition for online and digital work in Kenya is the improvement of ICT services in rural and remote areas. The government has made this possible through the improvement of ICT infrastructure connectivity across the country. Nevertheless, market-based strategies—for instance, the development of skill sets that meet the requirements of the market—that would stimulate investment in the sector, in addition to increased government access to ICT revenues from MMT, are essential to enhance growth.

The Kenyan MMT industry has recorded exponential growth relative to its neighbours, regardless of the obstacles faced. This could be attributed to Kenya's having the highest capability to use ICT effectively thanks to relevant skills, the highest availability of ICT infrastructure and access, and the highest level of IT use compared with Uganda, Tanzania, Rwanda, and Ethiopia. Kenya also has the most affordable mobile phone prices and most affordable mobile broadband services within the East Africa region, and this has also increased the uptake of ICT services, particularly mobile money services. This is in addition to Kenya's distribution network structure, friendly regulatory environment, and brand awareness of Safaricom, which have also played a significant part in MMT's extraordinary growth.

Given Kenya's status as a leading commercial and logistics hub in East Africa, coupled with the competitive strengths of smaller regional peers such as Rwanda (i.e. regulatory environment and research facilities), there is a unique opportunity for Kenya to lead the creation of a regional ICT cluster boasting a domestic market of 160 million consumers that can compete with not only other regional clusters on the continent such as South Africa, but also other emerging global ICT service clusters such as the Philippines (Akamanzi et al. 2016). Kenya could expand its services in the region and maximize the economies of scale required for not just the industry's success, but also its expansion. This can be achieved if Kenya identifies its market niche, generates investment prospects, and addresses the accompanying risks.

References

- Acs, Z.J., L. Szerb, and E. Autio (2016). 'Global Entrepreneurship Index 2016'. Washington, DC: Global Entrepreneurship Development Institute.
- Adam, C.S., and E.J.S. Walker (2015). 'Mobile Money and Monetary Policy in East African Countries'. Said Business School Discussion Paper. Oxford: University of Oxford. Available at: www.sbs.ox.ac.uk/sites/default/files/research-projects/mobile-money/Monetary-policy-paper.pdf (accessed 30 March 2017).
- Akamanzi, C., P. Deutscher, B. Guerich, A. Lobelle, and A. Ooko-Ombaka (2016). 'Silicon Savannah: The Kenya ICT Services Cluster'. *Microeconomics of Competitiveness*, Spring. Available at: www.isc.hbs.edu/resources/courses/moc-course-at-harvard/Documents/pdf/student-projects/Kenya%20ITC%20Services%202016.pdf (accessed 28 February 2017).
- A.T. Kearney (2016). 'Global Services Location Index'. Chicago: A.T. Kearney.
- Bloomberg (2012). 'Silicon Savannah: Kenya's Billion-Dollar Tech Bet'. *Bloomberg News*, 18 April. Available at: www.bloomberg.com/news/videos/b/fa73fc02-c511-4824-806d-5656acdfae7c (accessed 9 April 2016).

- Burgess, R., and R. Pande (2005). 'Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment'. *American Economic Review*, 95(3): 780–95.
- Central Bank of Kenya (2009). 'Annual Report, Kenya'. Nairobi: Government Press.
- Central Bank of Kenya, Kenya National Bureau of Statistics, and FSD Kenya (2016). 'The 2016 FinAccess Household Survey on Financial Inclusion?'. Nairobi: FSD Kenya.
- Chumo, K.P. (2015). 'Developments and Challenges of Business Process Outsourcing Sector in Kenya'. *European Journal of Business Management*, 7(36): 195–204.
- CAK (Communications Authority of Kenya) (2012-Q1). 'Quarterly Sector Statistics Report: First Quarter, July–Sept 2011/2012'. Nairobi: CAK.
- CAK (2015-Q1). 'Quarterly Sector Statistics Report: First Quarter, July–Sept 2015/16'. Nairobi: CAK.
- CAK (2016-Q2). 'Quarterly Sector Statistics Report: Second Quarter, Oct–Dec 2015/2016'. Nairobi: CAK.
- Deloitte (2010). 'Mobile Banking: A Catalyst for Improving Bank Performance'. New York: Deloitte. Available at oportunidades.deloitte.cl/marketing/Reportes-internos/Financiera/Diciembre/deloitte-bancaMovil.pdf (accessed 30 March 2017).
- Demirguc-Kunt, A., L. Klapper, D. Singer, and P. Oudheusden (2015). 'The Global Findex Database 2014: Measuring Financial Inclusion Around the World'. Policy Research Working Paper 7255. Washington, DC: World Bank.
- Digital Undivide (2012). 'Banking Without a Bank'. 9 December. Available at: digitalundivide.org/mpesa/ (accessed 30 March 2017).
- Donner, J., and C.A. Tellez (2008). 'Mobile Banking and Economic Development: Linking Adoption, Impact, and Use'. *Asian Journal of Communication*, 18(4): 318–22.
- Dutta, S., B. Lanvin, and S. Sacha Wunsch-Vincent (2016). 'The Global Innovation Index 2016: Winning with Global Innovation'. Geneva: Cornell University, INSEAD, and World Intellectual Property Organization. Available at: www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2016.pdf (accessed 30 March 2017).
- The Economist (2010). 'Outsourcing to Africa: The World Economy Calls'. *The Economist*, 25 March. Available at: www.economist.com/node/15777592?story_id=15777592 (accessed 30 March 2017).
- The Economist (2012). 'Upwardly Mobile'. *The Economist*, 25 August. Available at: www.economist.com/node/21560912 (accessed 16 April 2016).
- Fildes, J. (2010). 'Kenya's Ambitions for an Outsourced Future'. *BBC News*, 16 December. Available at: www.bbc.co.uk/news/technology-12004815 (accessed 30 March 2017).
- Financial Sector Regulators Forum (2015). 'Kenya Financial Sector Stability Report 2014, Issue 6'. Nairobi: Central Bank of Kenya. Available at: www.centralbank.go.ke/images/docs/kfs/FSR-2014.pdf (accessed 30 March 2017).
- Free, A. (2015). "'Development", Profiles and Prospects: Labour in Kenya's Outsourced Call Centres'. *Critical African Studies*, 7(1): 47–65.
- GSMA (2015). 'The Mobile Economy 2015'. London: Global Mobile Systems Association. Available at: www.gsamobileeconomy.com/GSMA_Global_Mobile_Economy_Report_2015.pdf (accessed 30 March 2017).

- Graham, M., and T.M. Waema (2014). 'Kenya BPO and ITES Policy Brief'. Available at: geospace.co.uk/files/policybrief.pdf (accessed 12 March 2014).
- IYF (International Youth Foundation) (2013). 'Analysis of ICT Enabled Youth Employment in Ghana, Kenya, and South Africa: Final Report—Kenya.
- Isenberg, D. (2009). 'KenCall: Can Nik Nesbitt's Venture Succeed in Kenya?' HBS 809-114. Boston: Harvard Business School Publishing. Available at: www.kencall.com/kencall/documents/HBS_Kencall_source_June_2009.pdf (accessed 5 June 2016).
- ITU (2013). 'The Mobile Money Revolution Part 1: NFC Mobile Payments'. Geneva: ITU Telecommunication Standardization Bureau, Policy and Technology Watch Division. Available at: www.itu.int/dms_pub/itu-t/oth/23/01/T23010000200001PDFE.pdf (accessed 24 March 2017).
- ITU (2015a). 'ICT Facts and Figures'. Geneva: ITU. Available at: www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf (accessed 30 March 2017).
- ITU (2015b). 'Measuring the Information Society Report 2015'. Geneva: ITU. Available at: www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2015/MISR2015-w5.pdf (accessed 30 March 2017).
- ITU (2016). 'Measuring the Information Society Report 2015'. Geneva: ITU. Available at: www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2016/MISR2016-w4.pdf (accessed 4 April 2017).
- Jussila, A. (2015). 'Mobile Money as an Enabler for Entrepreneurship: Case Eastern Africa'. Helsinki: Aalto University, School of Business.
- KICTB (Kenya Information and Communication Technology Board) (2011). 'Julisha Survey on Kenya ICT Market Overview'. Nairobi: KICTB. Available at: sites.google.com/a/ict.go.ke/tandaa/activities/julishakenyaictmarketsurvey2011 (accessed 17 February 2016).
- KICTB (2013). 'Connected Kenya 2017 Master Plan'. Nairobi: KICTB.
- Kesenwa, A., D.O. Oima, and M. Oginda (2013). 'Effects of Strategic Decision Making on Firm's Performance: A Case Study of Safaricom Limited, Nairobi, Kenya'. *International Journal of Business and Social Science*, 4(13): 93–105.
- Macmillan, R. (2016). 'Digital Financial Services: Regulating for Financial Inclusion, An ICT Perspective'. GDDFI Discussion Paper. Geneva: ITU. Available at: www.itu.int/en/ITU-D/Conferences/GSR/Documents/GSR2016/Digital_financial_inclusion_GDDFI.pdf (accessed 30 September 2016).
- Mann, L., and M. Graham (2016). 'The Domestic Turn: Business Process Outsourcing and the Growing Automation of Kenyan Organizations'. *Journal of Development Studies*, 52(4): 530–48.
- Mbiti, I., and D.N. Weil (2011). 'Mobile Banking: The Impact of M-PESA in Kenya'. Working Paper 17129. Cambridge, MA: NBER. Available at: www.nber.org/papers/w17129.pdf (accessed 30 March 2017).
- McCaffrey, M.L., L. Anthony, A. Lee, K. Githachuri, and G.A.N. Wright (2014). 'Agent Network Accelerator Survey: Kenya Country Report 2013'. Nairobi: Helix Institute of Digital Finance. Available at: www.helix-institute.com/sites/default/files/Publications/Agent%20Network%20Accelerator_Kenya%20Country%20Report_2013.pdf (accessed 1 March 2017).

- McKinsey and Company (2009). 'Seizing the Prize-Driving BPO Sector Growth in Kenya'. Nairobi: KICTB.
- McKinsey Global Institute (2013). 'Lions Go Digital: The Internet's Transformative Potential In Africa'. Seattle, WA: McKinsey and Company.
- MOIC (Ministry of Information and Communications) (2010). 'BPO/KPO Skills Gap Assessment Report'. Nairobi: Ministry of Information and Communications.
- Morawczynski, O., and M. Pickens (2009). 'Poor People Using Mobile Financial Services: Observations on Customer Usage and Impact from M-PESA'. CGAP Brief Online. Washington, DC: CGAP. Available at: www.cgap.org/sites/default/files/CGAP-Brief-Poor-People-Using-Mobile-Financial-Services-Observations-on-Customer-Usage-and-Impact-from-M-PESA-Aug-2009.pdf (accessed 20 March 2016).
- Muthiora, B. (2015). 'Enabling Mobile Money Policies in Kenya Fostering a Digital Financial Revolution: Mobile for Development Impact'. Geneva: ITU. Available at: www.itu.int/en/ITU-T/focusgroups/dfs/Documents/2015_MMU_Enabling-Mobile-Money-Policies-in-Kenya.pdf (accessed 24 March 2016).
- Ndiwalana, A., O. Morawczynski, and O. Popov (2010). 'Mobile Money Use in Uganda: A Preliminary Study'. In J. Svensson and G. Wicander (eds), *Proceedings of the Second International Conference on M4D Mobile Communication Technology for Development (M4D 2010), 10–11 November 2010, Kampala, Uganda*. Karlstad: Karlstad University Studies. Available at: kau.diva-portal.org/smash/get/diva2:357565/FULLTEXT01.pdf (accessed 30 March 2017).
- Ngigi, G. (2014). 'M-Shwari Lifts CBA Above Equity in Loan Accounts'. *Business Daily Africa*, 9 June. Available at: www.businessdailyafrica.com/M-Shwari-lifts-CBA-above-Equity-in-loan-accounts/-/539552/2342556/-/o6wxli/-/index.html (accessed 30 March 2017).
- Ng'weno, A., and Bill and Melinda Gates Foundation (2010). 'How Mobile Money Has Changed Lives in Kenya'. Seattle: Bill and Melinda Gates Foundation. Available at: docs.gatesfoundation.org/Documents/mobile-money.pdf (accessed 30 March 2017).
- Ochieng', D., D. Gichoya, and C. Odini (2011). 'Proposed ICT-Enabled Services Model for Local Authorities in Kenya'. In P. Cunningham and M. Cunningham (eds), *IST-Africa 2011 Conference Proceedings*. Dublin: International Information Management Corporation.
- Ogutu, J. (2015). 'How ICT Drives Kenya's Economic Growth'. *Standard Digital*, 18 May. Available at: www.standardmedia.co.ke/article/2000162611/how-ict-drives-kenya-s-economic-growth (accessed 30 March 2017).
- Oigara, J. (2015). 'Kenya Will Lead the Future of African Entrepreneurship'. *Daily Nation*, 22 July. Available at: www.nation.co.ke/oped/Opinion/KCB-Group-GES-Kenya-innovation/-/440808/2802860/-/10u4fhp/-/index.html (accessed 30 March 2107).
- Omondi, G., and V. Juma (2013). 'KRA Targets Small Businesses in Bid to Raise Sh974 Billion'. *Business Daily*, 17 July. Available at: www.businessdailyafrica.com/KRA-targets-small-businesses-in-bid-to-raise-Sh974-billion/-/539546/1918230/-/iwuo25/-/index.html (accessed 30 March 2107).
- Pandy, W., and M. Rogerson (2012). 'The Economic Geography of South Africa's Call Centre Industry'. *Urban Forum*, 23(1): 23–42.
- Peake, A. (2013). 'Kenya's ICT Sector, Mobile Money and the Transformation to a Middle-Income Country'. Tokyo: GLOCOM. Available at: www.glocom.ac.jp/j/chijo/118/101-113_B_adam.pdf (accessed 30 March 2017).

- Pickens, M., D. Porteous, and S. Rotman (2009). 'Scenarios for Branchless Banking in 2020'. Focus Note 57. Washington, DC: CGAP.
- Plyler, M., S. Haas, and G. Nagarajan (2010). 'Community-Level Economic Effects of M-PESA in Kenya: Initial Findings'. IRIS Centre Report. College Park, MD: University of Maryland. Available at: www.fsassessment.umd.edu/publications/pdfs/Community-Effects-MPESA-Kenya.pdf (accessed 30 March 2017).
- ROK (Republic of Kenya) (2004). 'E-government Strategy'. Nairobi: Government Printer.
- ROK (2007). 'Kenya Vision 2030: A Globally Competitive and Prosperous Kenya'. Nairobi: Government Printer.
- ROK (2012). 'Third Annual Progress Report 2010–2011 on the Implementation of First Medium Term Plan (2008–2012)'. Nairobi: Government Printer.
- ROK (2013). 'The National Broadband Strategy'. Nairobi: Government Printer.
- ROK (2014a). 'Economic Survey'. Nairobi: Government Printer.
- ROK (2014b). 'The Kenya National ICT Master Plan: Towards a Digital Kenya, 2013/14–2017/1'. Nairobi: ICT Authority.
- ROK (2015). 'Economic Survey'. Nairobi: Government Printer.
- ROK (2016). 'Economic Survey'. Nairobi: Government Printer.
- Runde, D. (2015). 'M-Pesa and the Rise of the Global Mobile Money Market'. *Forbes*, 12 August. Available at: www.forbes.com/sites/danielrunde/2015/08/12/m-pesa-and-the-rise-of-the-global-mobile-money-market/#34f3e67a23f5 (accessed 15 April 2016).
- Steadman Group Research Division (2007). 'Financial Access in Kenya: Results of the 2006 National Survey'. Nairobi: FSD Kenya.
- Thugge, K., N. Ndung'u, and R.O. Otieno (2009). 'Unlocking the Future Potential for Kenya: The Vision 2030'. Oxford: CSAE. Available at: www.csae.ox.ac.uk/conferences/2009-EdiA/papers/509-Owino.pdf (accessed 25 April 2016).
- UNESCO (2015). 'Discussions on the Theme of the 18th Session of the Commission on Science and Technology for Development, "Managing the Transition from the Millennium Development Goals to the Sustainable Development Goals: the Role of Science, Technology and Innovation"'. Geneva: UNCTAD. Available at: unctad.org/meetings/en/SessionalDocuments/e2015d78_en.pdf (accessed 30 March 2017).
- USAID (2015). 'Kenya Entrepreneurship Fact Sheet'. Washington, DC: USAID. Available at: www.usaid.gov/sites/default/files/documents/1860/Entrepreneurshippercent20factpercent20sheet.pdf (accessed 15 April 2016).
- Vaidyanathan, G. (2008). 'Technology Parks in a Developing Country: The Case of India'. *Journal of Technology Transfer*, 33(3): 285–99.
- Vaughan, P. (2007). 'Early Lessons from the Deployment of M-PESA, Vodaphone's Own Mobile Transactions Service, in the Transformational Potential of M-transactions'. In D. Coyle (ed.), 'The Transformational Potential of M-Transactions'. Policy Paper Series 6. London: Vodaphone.
- Vere, O., and R. Mautsa (2013). 'BPO and Call Centre Report'. Harare: Contact Centre Association of Zimbabwe.
- Waema, T. (2009). 'Development of a Business Process Outsourcing Industry in Kenya: Critical Success Factors'. Unpublished research report. Ottawa: IDRC.

- Waema, T.M., and M.N. Ndung'u (2012). 'What is Happening in ICT in Kenya: Evidence for ICT Policy Action'. Policy Paper 9. Cape Town: Research ICT Africa. Available at: www.researchictafrica.net/docs/Policy%20Paper%209%20-%20Understanding%20what%20is%20happening%20in%20ICT%20in%20Kenya.pdf (accessed 30 March 2017).
- Wambugu, S. (2010). 'Biting a Piece of the Outsourcing Pie'. *Daily Nation*, 12 August Available at: horizoncontactcenters.com/ke/userfiles/Biting_outsourcing_pie.pdf (accessed 31 March 2017).
- Wausi, A., R. Mgendi, and R. Ngwenyi (2013). 'Labour Market Analysis and Business Process Outsourcing in Kenya: Poverty Reduction Through Information and Digital Employment Initiative'. Research Report 2013-3. Nairobi: University of Nairobi, School of Computing and Informatics.
- WITSA (2003). 'E-Government Trends in 2003: Local Governments Using ICT'. Vienna, VA: WITSA. Available at: www.witsa.org/papers/WITSA-EGOV2003Final.pdf (accessed 30 March 2017).
- World Bank (2012). 'Information and Communications for Development 2012: Maximizing Mobile'. Washington, DC: World Bank. Available at: www.worldbank.org/ict/IC4D2012 (accessed 30 March 2017).
- World Bank (2014). 'World Development Databases'. Washington, DC: World Bank. Available at: data.worldbank.org/data-catalog/world-development-indicators (accessed 29 April 2016).