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BANCA MOBIL EN EL AFRICA SUB-SAHARIANA: ASENTANDO EL CAMINO HACIA EL DESARROLLO FINANCIERO

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Resumen

La importancia del desarrollo financiero para el crecimiento económico a largo plazo ha sido reconocida por en el diseño de política de todo el mundo. Las economías de rápido crecimiento con servicios bancarios formales limitados experimentan una mayor exclusión financiera. Entre ellas, la explosión en la tecnología de telefonía móvil en África presencié el rápido desarrollo de la banca móvil. Muchos países de África tienen una infraestructura de red de banca minorista precaria, especialmente en las zonas rurales. Las redes de comunicación móvil introdujeron productos innovadores para extender la banca móvil a lugares rurales remotos. El desarrollo de la banca móvil ha contribuido a una mayor inclusión financiera en el África Subsahariana. En menos de diez años, Kenia se ha convertido en el país líder en la región para la penetración de la banca móvil y ésta ha sido fundamental para proporcionar acceso a servicios financieros a individuos no bancarizados. Este artículo examina el estado del desarrollo económico en África y contextualiza las tendencias posteriores en la evolución de la banca en África Subsahariana.

Palabras clave: desarrollo financiero, inclusion financiera, tecnología móvil, banca minorista, Africa subsahariana

Mobile banking in Sub-Saharan Africa: setting the way towards financial development

Abstract

The importance of financial development for long-term economic growth has been recognised by policy-makers arounds the world. Fast growing economies with limited formal banking services experience greater financial exclusion. The explosion in mobile phone technology in Africa saw the rapid development of mobile banking. Many countries in Africa have poor retail banking network infrastructure especially in the rural areas. Mobile communication networks introduced innovative products to extend mobile banking into remote rural locations. The development of mobile banking has contributed towards enhanced financial inclusion in Sub-Saharan Africa (SSA). In less than ten years, Kenya has become the leading country in SSA for mobile banking penetration and mobile banking has been instrumental in providing access to financial services to the previously unbanked. This article surveys the state of economic development in Africa as contextualisation of subsequent trends in banking developments in SSA.

Keywords: financial development, financial inclusion, mobile technology, retail banking, Sub-Saharan Africa (SSA)

Claves JEL: O16, O55, G21, N77

1.- Introduction

The transformation of financial systems to enhance financial inclusion has been promoted mainly by social activists, non-government organisations and more recently by global organisations throughout the world. The results of the first Global Findex Survey, the world's most comprehensive database on financial inclusion, revealed that more than 50% of the world's adult population did not have access to financial services¹. The lack of access to financial services is a global problem, but is most pronounced in emerging economies. The importance of financial development for long-term economic growth has been recognised by policy maker arounds the world and more recently countries are using innovations in technology, especially mobile money, to expand financial services in emerging economies.² Generally three factors inhibit the penetration of mobile money. The first is the openness of markets affected by regulatory or juristic regimes. The second hurdle is social trust in the medium, which is a cultural trait and may need some time to break down. The third is practical solutions, such as physical infrastructure and simplicity of the solutions offered to overcome the access to money. Sub-Saharan Africa (SSA) has displayed particular success in addressing these limitations and in the use of mobile money. With an 82% mobile account penetration, SSA has the highest penetration of mobile banking across developing markets.³

This article surveys the current state of mobile banking adoption in SSA and highlights the role that mobile banking can play towards financial development and the enhancement of financial inclusion. The article contributes to three strands of theoretical literature namely the role of financial development on economic growth; the impact of mobile banking on financial development and the role of mobile banking towards enhancing financial inclusion. This article provides an analysis of the status quo of mobile banking in SSA in order to inform policy-making decisions. In future, an article could empirically assess the role of mobile banking in enhancing financial development and financial inclusion and its impact on economic growth.

The rest of the article is structured as follows: section two provides a background to the African economy and financial sector, section three briefly reviews the literature on the role of financial development in long-term economic growth; section four examines the connection between mobile banking and financial development in Africa; section five discusses the growing importance of financial inclusion; section six examines in detail the distribution of mobile technology in SSA and section seven concludes with policy implications.

2.- Background to the African economy and financial sector

Prior to the liberalisation of the financial sector commencing in the 1980s, many African banks⁴ were state-owned following nationalisation. Under government-owned bank monopolies, banks were heavily regulated, which restricted operations⁵. The banking systems in most African countries experienced two systematic changes namely the pre-independence and post-independence stages. Before independence the banking system was dominated by foreign banks which focused activities on serving colonial and large multinational businesses⁶. During the post-independence era of the 1970s, most banks were nationalised. State-owned

¹ Demirgüç-Kunt & Klapper (2012a), pp.1-58.

² Demirgüç-Kunt *et al.* (1995), pp. 1-88.

³ GMSA (2015), pp. 1-77.

⁴ Banks refer to government authorised deposit-taking institutions, which provide loans, pay interest and act as intermediaries in financial transactions. State-owned banks refer to banks whose shareholding is exclusively held by the state and foreign banks are banks whose shareholding is based outside of the country in which its operations are based.

⁵ Beck, Senbet & Simbanegavi (2015), pp. i3-i11.

⁶ Doku *et al.* (2013), pp. 1999-2010.

banks constituted part of governments' policies to accelerate economic transformation⁷. During the 1980s a number of failing state-owned banks as well as private banks were sold to either foreign investors or to cross-border banks. Financial systems in Africa developed rapidly during the 1980s and 1990s as a result of financial liberalisation⁸. As Sub-Saharan African economic growth posted growth rates around 6% per annum since the early 2000s⁹, a resurgence in foreign ownership of banks across Africa occurred. Some African banks expanded to other countries leading to the growth of cross-border banking between 2002 and 2014. Several South African banks, for example, expanded into various parts of Sub-Saharan Africa (SSA), Moroccan banks expanded south and Nigerian banks expanded throughout West Africa¹⁰. More recently Kenyan banks expanded into East Africa. Heightened competition in the financial sector led to the emergence of private African banking groups.

Banks in Africa constitute the main source of capital for large businesses, small and medium sized enterprises (SMEs) and for both the public and private sectors¹¹. Many businesses and SMEs do not have regular access to credit compared to countries with well-developed financial systems. This inhibits growth especially in the absence of access to finance from the equity market¹². African stock exchanges (with the exception of South Africa) are small when measured by the ratio of market capitalisation to Gross Domestic Product (GDP) compared to other developing economies and especially when compared to high income economies. In 2012 the World Bank established that African market capitalisation amounted to an average of only 38%, whilst other emerging economies stood at 44% and 62% in high-income markets¹³. The level of financial development in Africa, differs from country to country. Some have well-developed and sophisticated financial and capital markets, such as Mauritius and South Africa, whilst others lack that level of development. Many of the African population is dispersed among vast geographical areas which makes the provision of financial services outside of the urban areas both difficult and not cost effective¹⁴. As illustrated in Table 1 below, a number of SSA countries have vast geographical areas with a large proportion of the population in the rural areas:

Table 1.- Geographical area and population distribution.

Country	Area in 1 000 square kms	% of people living in rural areas -2014	% of people living in urban areas - 2014
Botswana	566,730	43%	57%
Democratic Republic of Congo	2,267,050	58%	42%
Côte d'Ivoire	318,000	47%	53%
Ethiopia	100,000	81%	19%
Ghana	227,540	47%	53%
Kenya	569,140	75%	25%
South Africa	1,213,090	36%	64%

⁷ Doku *et al.* (2013), pp. 1999-2010.

⁸ Beck (2015), pp. i32-i45.

⁹ Cho & Tien (2014), pp. 1-40.

¹⁰ Beck, Senbet & Simbanegavi (2015), pp. i3-i11.

¹¹ Mullineux & Murinde (2014), pp. 66-72.

¹² Demirgüç-Kunt & Klapper (2012b), pp. 1-61.

¹³ Beck & Cull (2012), pp. 1-41.

¹⁴ Beck & Cull (2012), pp. 1-41.

Tanzania	885,800	69%	31%
Uganda	200,520	84%	16%

Source: Data obtained from World Development Indicators (The World Bank 2016)

The overall market deregulation effecting financial services and the improved factor mobility enhanced business prospects for new African enterprises. Rapid economic growth depends on optimal factor mobility, including the movement of money. Africa has therefore experienced unprecedented growth in telecommunication infrastructure and information technology connectivity¹⁵. Mobile technology developments dovetailed these trends in Africa. The mobile industry is a key driver of economic growth and employment across Africa. In 2014 the broader mobile ecosystem contributed 5.7% to SSA's GDP. This was a contribution of \$102 billion in economic value and supported 4.4 million employment opportunities in the region. The mobile ecosystem contributed approximately \$15 billion to public finance through taxes paid¹⁶.

3. Financial development and economic growth

The long standing debate about the role of financial development in economic growth¹⁷ has some well-known economists such as Robert Lucas and Joan Robinson strongly disputing that financial development causes economic growth¹⁸ whilst, Merton Miller strongly supports that idea. Others such as Goldsmith, Gurley, McKinnon, Schumpeter and Shaw argue that the impact of financial development on economic growth cannot be ignored¹⁹. Schumpeter identified the role of banks in economic development as agents enabling clients to manage risk, create wealth and allocate resources to wealth-creating projects²⁰. Pioneering contributions to the understanding of the relationship between financial development and economic growth have been made by Goldsmith²¹, McKinnon²² and Shaw²³ and have stimulated the debate²⁴. Reviews of the link between finance and economic growth, have confirmed a strong positive link between the functioning of the financial system and long-run economic growth²⁵ and, more recently, that there is a positive independent and causal relationship to long-term economic growth²⁶.

4. Mobile banking and financial development

Research on the role of mobile phones and financial services in developing countries gained prominence recently. This research is predominately undertaken by ground level surveys for specific purposes of practitioners and, to lesser extent, by academics²⁷. Duncombe

¹⁵ Deloitte & Touche (2014), pp. 1-35.

¹⁶ GMSA (2015), pp. 1-75.

¹⁷ King & Levine (1993), pp. 717-737; Levine (1997) pp. 688-726, (2005), pp. 865-934; Čihák *et al.* (2012), pp. 1-58.

¹⁸ Cihak *et al.* (2012), pp. 1-58.

¹⁹ Levine (2005), pp. 865-934.

²⁰ Schumpeter (1934).

²¹ Goldsmith (1969).

²² McKinnon (1973).

²³ Shaw (1973).

²⁴ De Gregorio & Guidotti (1995), pp. 433-448; Carbo-Valverde, Marques-Ibanez & Rodríguez-Fernández (2012), pp. 80-101.

²⁵ Levine (1997), pp. 688-726; (2005), pp. 865-934.

²⁶ Demirgüç-Kunt & Levine (2008).

²⁷ Duncombe & Boateng (2009), pp. 1237-1258.

and Boateng²⁸ highlighted the need for primary research and the conceptual understanding of mobile phones in the development of financial services. This article contributes towards the understanding of mobile banking and its impact on the financial development in Sub-Saharan Africa.

There is a small growing literature on financial development in Africa, in particular on the rise of mobile banking in financial development. Porteous²⁹ described the various models of mobile banking globally, particularly in Africa, and identified which models, and enablers were needed to broaden access to financial services. Porteous found that the growth of mobile banking globally had been slower than expected, with critical mass only being achieved in parts of Asia. The study identified two important aspects for early market development namely openness and certainty of regulatory environment. Openness referred to the policy, legal and regulatory environment that allows for the entry of new participants and certainty that this environment would not be subject to arbitrary changes which could prejudice new entrants. Transformational mobile banking products (providing access to previously unbanked) needed to overcome the complex regulatory and policy environment which often cuts across various regulatory domains. Porteous concluded that enablement of mobile banking in the regulatory and policy environment was needed to facilitate the widespread adoption of mobile money.

Porteous³⁰ then explored how mobile banking reached the unbanked in South Africa utilising data from the results of the FinScope Household surveys. It was estimated that of the unbanked, 4.8 million (approximately 1/3 of the unbanked) had mobile phones, which highlighted the potential of mobile banking to reach the unbanked. Porteous however concluded that mobile banking had not yet shifted the access frontier for transactional banking but highlighted the potential for this to take place. The majority of mobile banking users were found to be urban and formally employed, with a higher income and education, and was older. Education on the use of mobile banking was needed. The lack of trust in and awareness of mobile banking were identified as significant barriers to the widespread adoption of mobile banking.

Jack & Suri³¹ conducted surveys on 3 000 randomly selected households in Kenya in 2008 and a follow-up survey of 2 016 of the same households in 2009. These surveys showed that M-Pesa services reached approximately 40% of the total population and provided access across socio-economic strata and a vast geographical distribution. M-Pesa was a particularly effective means of money transfer and provided access to financial services to an ever broadening spectrum of the population across economic, demographic, and educational profiles. The rapid spread of M-Pesa was primarily attributed to the increase in the number of agents with approximately 23 000 M-Pesa agents spread throughout Kenya facilitating access to financial services. Jack & Suri also identified a number of potential economic effects on the household level (impact on savings and investment, risk spreading) but more empirical evidence is needed to quantify these impacts.

Mbiti & Weil³² evaluated the impact of the use of M-Pesa in Kenya empirically using firm level data to assess the impact on remittance prices on competitors and found that M-Pesa put downward pressure on competitors' prices. Mbiti & Weil also tested the micro-level impact of M-Pesa, using results from FinAccess Surveys for 2006, and 2009. The findings confirmed earlier studies that M-Pesa users were more likely to reside in urban areas, to be educated, banked and have a higher income. M-Pesa was found in many instances, to be a complement to existing banking services rather than reaching the unbanked. Furthermore, the authors did

²⁸ Duncombe & Boateng (2009), pp. 1237-1258.

²⁹ Porteous (2006), pp. 1-57.

³⁰ Porteous (2008).

³¹ Jack & Suri (2011), pp. 1-31.

³² Mbiti & Weil (2011).

not find evidence that M-Pesa was savings enhancing (possibly because no interest is paid on balances). Burns³³ exploration into the extension of financial access to the unbanked in developing economies contributed to the debate by highlighting that M-Pesa enhanced financial inclusion and financial deepening in Kenya. Burns attributed the success of M-Pesa mainly to the institutional environment in Kenya that protected private property and thereby encouraged private entrepreneurs to provide innovative solutions to new markets.

5. Financial inclusion and the role of mobile money

The importance of financial inclusion for long-term growth has pushed the agenda of financial inclusion forward, especially by the initiatives of a number of central banks seeking to improve financial inclusion³⁴ and the recognition of international institutions such as the G20 and International Monetary Fund (IMF)³⁵. Financial inclusion can be defined as:

‘access by enterprises and households to reasonably priced and appropriate formal financial services that meet the needs of enterprises and households’³⁶.

The World Bank identifies two types of financial exclusion namely voluntary (or self-exclusion) and involuntary exclusion³⁷. Voluntary exclusion refers to people who do not identify their need for financial services or choose to remain outside of the financial system due to cultural or religious considerations. Involuntary exclusion refers to exclusion due to insufficient income, discrimination, lack of information, price barriers etc.³⁸. In developing countries the security concern of ordinary people carrying cash, has become an additional motivation to address financial exclusion of the vast unbanked sector. Globally it is estimated that two billion people, of whom more than half are adults, do not have a bank account. In Africa only one in four persons has a bank account, but eight in ten have access to a mobile phone.

Empirical studies found that financial inclusion can alleviate poverty, reduce income inequality and increase the wealth of the low-income population³⁹. The growing evidence of the benefits to individuals of financial inclusion, especially having a bank account, provide an economic and political rationale for governments and policy makers to promote financial inclusion⁴⁰. Swamy⁴¹ states:

‘Access to safe, easy, and affordable credit and other financial services by the poor and vulnerable groups, disadvantaged areas and lagging sectors is recognized as a pre-condition for accelerating growth and reducing income disparities and poverty’

Despite the growing evidence on the benefits of financial inclusion, differences remain on the optimal policies to promote both financial and economic development⁴². On the practical side there is mounting global interest by donors, governments, regulators, banking and the commercial sectors in the use of mobile technologies to deliver financial services to emerging economies⁴³. Mobile banking can be described as ‘a set of mobile banking services, involving the use of portable devices connected to telecommunications networks that provide users with

³³ Burns (2015).

³⁴ Amidžić, Massara & Mialou (2014).

³⁵ Demirgüç-Kunt (2014), pp. 349-356.

³⁶ Beck, Senbet & Simbanegavi (2015), p. i5.

³⁷ World Bank (2014).

³⁸ World Bank (2014).

³⁹ Levine (1998), pp. 596-613; Beck, Demirgüç-Kunt & Levine (2007), pp. 27-49; Honohan (2008), pp. 2493-2500; Bruhn & Love (2014), pp. 1347-1376.

⁴⁰ Klapper & Singer (2015), Allen *et al.* (2016), pp. i12-i31.

⁴¹ Swamy (2014), p. 2.

⁴² Burns (2015), pp 1-44.

⁴³ Duncombe & Boateng (2009), pp. 1237-1258.

access to mobile payments, transactions and other banking and financial services linked to customer accounts, with or without the direct participation of traditional banking institutions⁴⁴. There are four main categories of mobile banking business models: bank-led, telecom-led, independent non-telecom and non-bank agents, and any combination or hybrid of bank and non-bank partnerships⁴⁵. The type of business model employed is determined mainly by the regulatory framework in that country. Bank-led models of mobile money services are typically regulated by strict banking regulations whereas the telecom-led models are either regulated by the telecoms regulators and/or the banking regulations. The regulation is normally driven by the government's definition of e-money and therefore the regulation of mobile money.

Mobile network operators provide the network infrastructure required for mobile payments, thus providing convenience to customers and ease of use. Mobile banking is able to leverage off the existing mobile telecommunication networks to provide financial services to the previously unbanked. Financial institutions have also launched their own mobile applications by entering into partnerships with the mobile networks to provide financial services. Mobile banking is able to overcome the high costs associated with fixed line telecommunication networks, as there are lower costs for building infrastructure, and lower costs associated with the development, provision and use of the services⁴⁶. Mobile networks are also more scalable and can expand rapidly in response to changes in demand for the services⁴⁷. Mobile networks therefore provide an opportunity for financial institutions to improve financial inclusion by providing a diverse range of financial services at a lower cost to the poorest sections of the population and those dispersed in the rural/remote areas⁴⁸.

Many developing economies are pioneering the use of mobile and technological innovations to address financial inclusion⁴⁹ (Alliance for Financial Inclusion 2011). Successful mobile banking penetration in developing economies has taken place mainly in Africa and South Asia. SSA has shown strong growth in unique mobile subscribers which placed the region in third position behind Asia Pacific and Europe at the end of 2014. In Table 2 below, the number of mobile subscriptions in selected countries in SSA is shown:

Table 2.- Mobile subscriptions per 100 inhabitants in Africa (selected countries), 2004-2014.

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Ghana	8	13	24	34	50	64	72	85	101	108	115
Kenya	7	13	20	30	42	49	61	67	71	72	74
Nigeria	7	13	23	27	42	48	55	58	67	73	78
South Africa	44	70	81	85	90	91	98	123	131	146	149
Tanzania	5	8	14	20	31	40	47	55	57	56	63
Uganda	4	5	7	14	27	29	38	48	45	48	52

Source: Compiled from data obtained from the International Telecommunications Union⁵⁰ (2016)

⁴⁴ Diniz, Cernev & Albuquerque (2011), p. 3.

⁴⁵ Porteous (2006), pp. 1-57.

⁴⁶ Dholakia & Dholakia (2004), pp. 1391-1396.

⁴⁷ Dholakia & Dholakia (2004), pp. 1391-1396.

⁴⁸ Diniz, Cernev & Albuquerque (2011), pp. 1-35.

⁴⁹ Alliance for Financial Inclusion (2011).

⁵⁰ International Telecommunications Union (2016).

The number of mobile subscribers is used to estimate the number of mobile phone users and to determine the penetration rates. However in Africa, it is common for mobile phones to be shared, and thus more people may be using mobile phones than indicated by these penetration rates⁵¹. The figures in Table 2 clearly show the rapid spread of mobile subscriptions in SSA over the past few years, primarily in East Africa. During the first decade of the twenty-first century SSAs subscriber base increased by 13% which is well above the global average growth of 6%. In Table 3 below, the growth in the number of subscriptions across the globe is illustrated:

Table 3.- Mobile subscriptions per 100 persons, 2006-2014

Region	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Africa	12	18	24	32	38	45	52	59	66	71
Arab States	27	39	53	63	76	88	99	105	110	110
Asia & Pacific	23	29	37	47	56	67	76	81	87	91
CIS	60	82	96	112	127	134	127	130	137	138
Europe	92	101	112	117	117	115	118	120	120	121
The Americas	52	62	72	81	87	94	101	104	108	108

Source: Compiled from International Telecommunications Union data⁵²

By mid-2015 200 million persons across Africa were accessing the internet through mobile devices.⁵³ The expansion of mobile broadband networks assisted the rollout of 3G and 4G technology, which is also enhanced by the growing adoption of cheaper smartphone devices. ECOWAS, the Economic Community of West Africa, with 163 million unique subscribers, comprises around 40% of SSA subscribers. The region has a mobile penetration rate exceeding the SSA average, but the latter penetration rate varies significantly amongst members. Technological innovation is slow in West Africa, with 2G accounting for 90% of mobile connections. For data-only operations 4G networks are being introduced in Côte d'Ivoire, Ghana and Nigeria, but those services are primarily limited to a few major centres. Smartphone usage accounts for only 20% of total connections. In the ten member Economic Community of Central African States mobile penetration reached 38% by 2014, with 43 million unique subscribers in 2015. The level of technological innovation is low, with 90% still using 2G technology, although broadband introduction in Angola and Gabon facilitates the introduction of 4G, but smartphone usage is only at 15%⁵⁴.

6.- Mobile banking in Africa

As Africa and South Asia led developing countries in mobile banking penetration, Sub-Saharan Africa had more unique subscribers than Latin America by late 2014. Many African countries have a shallow financial services access measured by access to ATMs and bank branches. This is illustrated in the following Tables 4 and 5:

Table 4.- Number of ATMs per 1 000 people in Africa (selected countries), 2008 – 2014.

Country	2008	2009	2010	2011	2012	2013	2014
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⁵¹ James & Versee (2007), pp. 117-126.

⁵² International Telecommunications Union (2016).

⁵³ GMSA (2015).

⁵⁴ GMSA (2014).

Ethiopia	0.07	0.10	0.30	0.32	0.46	*	*
Ghana	3.84	3.88	3.93	4.07	5.47	8.13	8.20
Kenya	5.96	7.24	8.90	9.12	9.57	9.71	10.20
Nigeria	8.57	11.4	11.1	11.8	11.4	13.2	16.1
South Africa	43.19	51.38	55.81	57.76	57.62	58.67	66.20
Tanzania	2.53	3.31	4.01	4.69	5.16	5.62	5.74
Uganda	2.50	3.20	3.45	3.68	4.00	4.60	4.23

Source: Data compiled from International Monetary Fund Financial Access Surveys⁵⁵

* data not available

Table 5.- Number of bank branches per 1 000 people in Africa (selected countries), 2008-2014.

Country	2008	2009	2010	2011	2012	2013	2014
Ethiopia	1.20	1.32	1.37	1.91	2.95	*	*
Ghana	3.84	5.09	5.36	5.38	5.68	5.86	4.37
Kenya	4.10	4.40	4.71	4.99	5.28	5.40	5.80
Nigeria	6.21	6.43	6.51	6.35	5.76	5.86	5.56
South Africa	7.75	9.15	9.85	10.29	10.01	10.19	10.94
Tanzania	1.69	1.82	1.83	1.89	2.14	2.49	2.26
Uganda	1.99	2.30	2.39	2.32	2.62	2.81	2.90

Source: Data compiled from International Monetary Fund Financial Access Surveys (2016)

* data not available

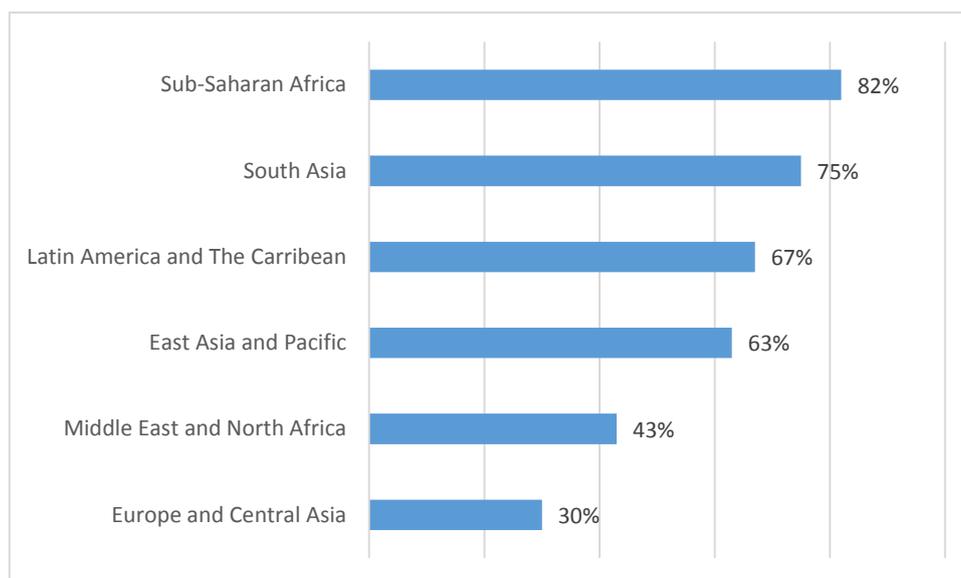
The statistics in Table 4 and Table 5 highlight the lack of access to financial services (with the exception of South Africa), however all these countries implemented mobile banking successfully. These countries used the existing mobile telecommunications infrastructure to overcome the lack of retail banking infrastructure and to improve access to financial services over time. Many new ATMs were installed together with the rapid expansion of mobile money to facilitate the conversion of mobile money into physical cash.

The most success has been achieved in SSA with 82% of 'money' being mobile money, according to the GMSA global survey (Figure 1)⁵⁶:

Figure 1.- Percentage of developing markets with mobile money by region

⁵⁵ International Monetary Fund (2016).

⁵⁶ GMSA (2015).



Source: Data from GMSA (2015)

By the end of 2015, SSA unique subscribers had risen from 200 million in 2010 to 386 million (with a penetration rate of 41%) and 722 million connections (or a 77% penetration rate). Kenya is especially known for the mobile banking innovation leadership in Africa. This country has adopted widespread and diversified use of mobile payments. It is estimated that 60% of the GDP of Kenya moves through mobile money⁵⁷. This is mainly as a result of the launch in March 2007 by Vodafone, for Kenya’s largest mobile network provider Safaricom, of the mobile money product M-Pesa (‘M’ denoting mobile and Pesa is the Swahili word for money). M-Pesa facilitates person-to-person transfers through the use of mobile phones. Mobile phone operators observed that people were selling airtime into a network akin to a banking grid, which enabled the recipient to re-sell the airtime and thereby netting ‘cash’ for the sold airtime. In remote areas and in the absence of extensive branch networks, mobile phones facilitate cheap and instant payments to the broad population. M-Pesa uses a mobile phone to transfer money, deliver finance and also later developed microfinancing facilities. M-Pesa enables users to deposit money into an account stored on the mobile phone. The account holder can then use a Short Message Service (SMS) using a secured Personal Identification Number (PIN) to send money to other users or withdraw deposited money at different retail outlets or pay for goods and services.

M-Pesa has been very successful and four years after its launch, it is estimated that approximately 70% of all households in Kenya are using M-Pesa. As this system makes use of SMS technology, it provides a wide range of users access to this technology, without the need for a smartphone. The use of mobile technology reduces the cost of sending money over large distances significantly and provides certainty of process and minimises the risk of theft. The M-Pesa system consists of agents, dispersed around the country, who convert mobile money into physical cash and vice versa⁵⁸. During the last 11 months of 2014 transactions to the value of more than K Shillings 2.1 trillion were conducted through M-Pesa in Kenya – which equates to almost half the value of the country’s GDP.

Shortly afterwards, product innovation led to the introduction of M-Shwari, a savings and loan facility. M-Shwari signed up nine million customers and attracted deposits to the value of K Shillings 135 billion (\$1.6 billion) within the first two years of its launch. The loans issued through M-Shwari are cheaper to administer and easier to scale than the micro-lending schemes

⁵⁷ Pénicaud (2013).

⁵⁸ Jack & Suri (2014), pp.183-223.

in operation. The M-Pesa facility was later linked to formal bank accounts through a partnership with the Equity Bank, based in Kenya. The product is M-Kesho, which is a facility using both the M-Pesa platform and agent network to offer more banking services to customers, such as interest-bearing accounts, loans and insurance.

In most SSA markets lively competition exist between service providers, except in Ethiopia. Ethiopia has only one active mobile network operator, Ethio-Telecom (and is also the sole fixed line provider), which is a legacy of the former nationalisation of the economy. In some markets four or five operators compete, resulting in a very low Herfindahl-Hirschman Index (HHI) of 4 834. This means that intense competition keeps costs low – a phenomenon that impacted negatively on operator margins resulting in discouraging new entrants and gradual consolidation of competitors. In Tanzania Airtel acquired Zantel; in Kenya Safaricom and Airtel jointly acquired Yu's assets in the Republic of Congo and Uganda Airtel also acquired the competitor Warid Telecom. Consolidation and expanding networks incentivised technological innovation, with expanding 3G uptake and the gradual 4G delivery in the technology-leading markets of Angola, South Africa and Zimbabwe. The new technology is gradually supported by the growing use of smartphones, as these devices become cheaper. In 2015, 160 million smartphones were in use in Africa.⁵⁹

In 2008 M-Pesa was launched in Tanzania, but did not attract the same subscriber volumes as in Kenya. Vodafone introduced strategic changes to its service delivery to improve its market position in Tanzania, which resulted in the rapid expansion of the use of mobile technology. By March 2013 the number of M-Pesa users rose to 5 million in Tanzania and by the end of 2015, Tanzania had the highest proportion of registered mobile money account users per 1 000 adults in Africa – 1208 per 1000, compared to 1018 in Kenya, 762 in Uganda and only 76 in South Africa⁶⁰. Since the launch of M-Pesa other competitors such as Mobikash, Orange Money and Airtel Money now offer similar services to M-Pesa. M-Pesa has since spread to Albania, the Democratic Republic of Congo, Egypt, Ghana, India, Lesotho, Mozambique, and Romania.

Vodacom South Africa launched M-PESA in September 2010 in partnership with Nedbank, envisaging similar successes to Kenya. South Africa, in contrast to the markets in East Africa, has a highly developed financial system. Local banks had already taken steps to make banking easily accessible to the low-income earners by increasing the number of branches in rural areas and providing bank accounts specifically tailored for the unbanked population. Nedbank was relying on the extensive mobile phone penetration in South Africa as well as the 13 million economically active South Africans without bank accounts, to grasp the opportunity M-Pesa offered for swift and cheap money transfers and retail purchases. South Africa already had other mobile banking applications and a number of these banking applications were provided by local banks. M-Pesa did not achieve initial success in South Africa – it was taken up by just 100 000 users by May 2011. However, unlike in Kenya, fewer agents were distributed around the country and its financial partner, Nedbank, did not have the branch network to support the penetration of M-Pesa in remote rural areas.

The reasons for the lack-luster appetite in the South African market for the M-Pesa opportunity were varied. In the first instance cheap accessible channels existed to transfer money. The largest retailer in South Africa, Shoprite, had already implemented a facility to enable customers to deposit money for a small fee of R9.99 at any Shoprite outlet (of which there are more than 900 outlets in South Africa and 294 corporate and 39 franchise stores outside South Africa in 14 African countries) to any branch in the country, where the recipient can make withdrawals upon payment of purchases, or simply use it to purchase consumer goods

⁵⁹ GMSA (2015), pp. 1-73

⁶⁰ GMSA (2014), pp. 1-77.

from the outlet branch. Furthermore a preference for cash remained high amongst those persons wanting to transfer money. A survey in 2014 undertaken with persons sending or receiving remittance transfers within South Africa, indicated that 32% sent cash to a relative or friend.⁶¹

The regulatory rigidity in South Africa also contributed to the sluggish uptake of M-Pesa. The South African Reserve Bank (SARB) does not implement a special dispensation for non-bank or e-money providers. This is the reason why mobile money providers in South Africa partner with banks, which is the strategic opposite of the experience in the other African markets. These mobile money providers in South Africa are treated as banks and must comply fully with all the requirements associated with banks – such as customer identification by means of face-to-face identity verification and proof of residence. In Tanzania regulatory accommodation in a different manner as for formal banks, was the key to the success after Vodacom made the initial service delivery adjustments. In all the other African jurisdictions the regulatory accommodation of mobile money providers outside the formal banking system has encouraged competition, pushed costs down and stimulated the growth in mobile money usage. The reliance on Nedbank was also an error of judgement, since Nedbank had little penetration amongst the lower-income groups in rural areas and no attempt was made to establish a widespread and informal infrastructure similar to Kenya.⁶²

The implementation of M-Pesa was suspended but re-launched in June 2011. A much expanded network of agents in remote areas, where people live and work, was introduced. The SARB had not relaxed the regulatory requirements. The re-launch targeted people of a higher Living Standards Measure (LSM) were targeted, but only 1.6 million users were attracted, despite the low transaction fee of R10 per transaction. Vodacom was again forced to re-think and re-designed the project once again. The new M-Pesa in South Africa was launched again on 31 July 2014 with Bidvest as a partner. This time new features were added to the product. A chip and pin protected Visa card was added to the service; a voucher system was added to upload cash and convert cash to M-Pesa, similar to buying airtime, at all Vodacom shops, selected spaza shops (small township grocery or convenient stores) and retailers; access was significantly expanded to 27 000 ATMs and over 240 000 merchant outlets in South Africa; person-to-person transfers were introduced and customers were promised that additional functionality would be added in the near future, and finally usage rewards were introduced. These included airtime and other offers, e.g. a doubling of airtime when purchasing airtime via M-Pesa, and free airtime for activating the M-Pesa Visa card (Goldstuck 2014).

Market commentators were skeptical about the possibility of the South African M-Pesa project ever posting the impressive successes of East Africa markets⁶³. The reality of the attempts to duplicate a successful service from other African locations in South Africa is that it failed. With a population in excess of 50 million people, the message is that ‘one size does not fit all’. The financial environment in South Africa has been well established, is securely entrenched in a regulatory framework maturing since the establishment of the first central bank in Africa, the SARB in 1923. A sophisticated financial services sector is subject to regulatory oversight, which contributed to the relative superficial impact of the GFC on South Africa. The insistence by the SARB on FICA (Financial Intelligence Centre, Act 53 of 2008, amended 2010), compliance indeed subjects the mobile money industry to onerous administrative procedures, but this is South Africa. The SARB is not prone to relax these requirements in the light of the concerted effort to curb criminal activities related to money laundering.⁶⁴

The well-entrenched retail banks have succeeded in introducing many entry-level services to the unbanked sector, whereby many of the needs of the unbanked had been addressed

⁶¹ Robb (2015).

⁶² Goldstuck (2014).

⁶³ Tarrant (2015).

⁶⁴ South African Reserve Bank (2013).

differently from other African markets with much leaner financial services networks or less sophisticated service provision. The FNB (First National Bank) ‘e-wallet’ allows anyone with a valid South African mobile phone to send and receive money. The Shoprite country-wide money transfer service at a fraction of the cost of formal bank transfers, competes in the same market served by the M-Pesa product in Kenya and Tanzania. A more convincing argument explaining the less than optimal success of M-Pesa in South Africa is that Vodacom changed the marketing angle every time the service was re-launched in South Africa, without identifying explicitly what M-Pesa was in South Africa. At the first introduction of the service it was marketed as a mobile money solution, then in 2011 as a mobile money wallet allowing the user to store money safely, and in 2014 it was advertised as a platform to swipe and buy with a Visa card linked to the mobile phone.⁶⁵ The message was mixed and created confusion.

Vodacom also faced competition in the mobile market from FNB, MTN, Standard Bank, and Net 1 launching or re-launching their own products. MTN, for example, had launched Mobile Money in Uganda in 2009 and it was successful with over 970 000 users within the first year. In August 2014, MTN partnered with Centenary Bank in Uganda to allow their Mobile Money Customers to withdraw cash from any of Centenary Bank’s ATMs across Uganda. Additionally, MTN launched Mobile Money in South Africa in 2012, and after receiving regulatory approval in March 2014, is able to offer a fully accessible bank account on a mobile device. Moreover, customers are able to use the Mobile Money Visa card at ATMs and till points to pay various electronic bills and earn customer loyalty points at Pick n Pay stores (grocery retailer). The success of the MTN mobile money initiative with Pick’n Pay may be attributed to the fact that as a retailer as opposed to a bank – where the bank charges are notoriously expensive – and its mass customer base, this partnership was able to provide low cost transactions to a large number of customers⁶⁶. In May 2016, Vodacom decided to discontinue offering M-Pesa in South Africa citing the lack of critical mass, and the limited future growth opportunities due to the high levels of financial inclusion as rationale for the discontinuation of these services.⁶⁷

Mobile banking has also spread to other countries in Africa. The advantage of M-Pesa as the first mover in the market is difficult to match, but the growth in demand and the overall competitive environment of more open markets contributed to the explosion in the industry. The successful expansion in Tanzania where figures released by Vodacom in September 2014 show transactions to the value of \$1.2 billion per month through M-Pesa (a figure that equals a third of Tanzania’s GDP), is testimony to the future of mobile money transactions in SSA⁶⁸. The growth in the Tanzanian market occurred against the background of the very limited banking services networks in the country. Vodacom partnered with M-Pesa to fill the gap, but the Tanzanian market is an open competitive market with Tigo and Airtel operating as competing mobile service providers. The expansion is primarily ascribed to the large number of agents supporting all three service providers. In 2013 there were approximately 20 000 M-Pesa agents, but by 2014 this number has risen to 73 000 – and around 2 500 agents were added monthly. This success shows how the Tanzanian society embraced the liberal market as Vodacom doubled its network recently. Vodacom first closed the 2G gap and then moved to become the market leader in 3G service provision in Tanzania. M-Pesa complemented these efforts by securing interconnections with Tanzanian banks, which gave Vodacom access to both the banked and the unbanked sector in the country. Where M-Pesa was first used to transfer money to family and friends, as had been the case in Kenya, it developed into a business tool allowing customers the facility to pay for services, such as utilities (water and

⁶⁵ Tarrant (2015).

⁶⁶ De Vos (2014).

⁶⁷ Costello (2016).

⁶⁸ De Vos (2014).

electricity). Merchant payment solutions were added to enable retailers to receive payment directly from an M-Pesa account. M-Pesa emerged as an entrepreneurial opportunity – agents earned commission from transactions, withdrawals are at a cost, but not deposits. Agents conducting 1300 transactions per month, can earn up to \$350.⁶⁹

The developments in Ghana follow the trend. The official unbanked segment of the population is 70%, but the rapid growth in the mobile money industry resulted in the number of registered mobile money customers leaping from 3 303 837 (2013) to 5 424 650 (2014), an increase of 64%. The government passed new mobile money regulations in July 2015, which streamlined transaction flows, collaboration between the mobile money industry and the banking system and the Bank of Ghana. Competition is tough, with four mobile telecommunication companies operating in the market – Airtel, MTN, Tigo, Vodafone. In November 2015 Vodafone extended M-Pesa to Ghana, adding Ghana as the eleventh M-Pesa market. These developments are remarkable, given the findings of a study by Vivian Dzokoto in 2013 indicating a resounding preference for cash and deep mistrust of mobile money in Ghanaian society⁷⁰. A factor that affects the industry adversely though, is the high levels of taxation of the industry in Ghana. Taxes account for almost 25% of the cost of mobile ownership and the \$650 million the mobile operators pay in taxes annually, constitutes about 40% of total revenue in the sector.⁷¹

In Uganda the communication sector is one of the fastest growing sectors in the economy. The sector was opened to competition in 2007, currently allowing four operators (MTN Uganda, Orange Uganda, Uganda Telecom Limited and Warid Telecom). MTN is the dominant industry player controlling 41% of the mobile market, but there is strong competition from the other operators. There is no legislation governing money services in Uganda, but also no legal provision for third parties delivering financial services of permission to non-banks to issue mobile money without being subject to the full of prudential regulations applicable to banks⁷². The Bank of Uganda found an innovative route around these limitations by requesting mobile money operators to enter into partnerships with banks that had to apply to the Bank of Uganda for a ‘letter of no objection’ to supply mobile money services. By 2015 the statutory position was unchanged in Uganda, which left the Bank of Uganda no alternative but to issue ‘guidelines’ to provide greater clarity to the mobile money industry. This regulatory context displays some similarity to the South African situation, but was different from Kenya, where the government refrained from linking the regulation of the banking system to the mobile money industry. The Ugandan mobile market was nevertheless growing – 50% of mobile phone owners made or received regular payments using their phones. Agents are predominantly performing cash-in-cash-out transactions whereas other bank related services such as bill payments and airtime top-ups, saving, credit and insurance transactions are almost non-existent⁷³. The following countries in SSA have all achieved successful mobile money penetration of more than 10%, with Kenya as the clear leader (Figure 2):

Figure 2.- Mobile money penetration (%)

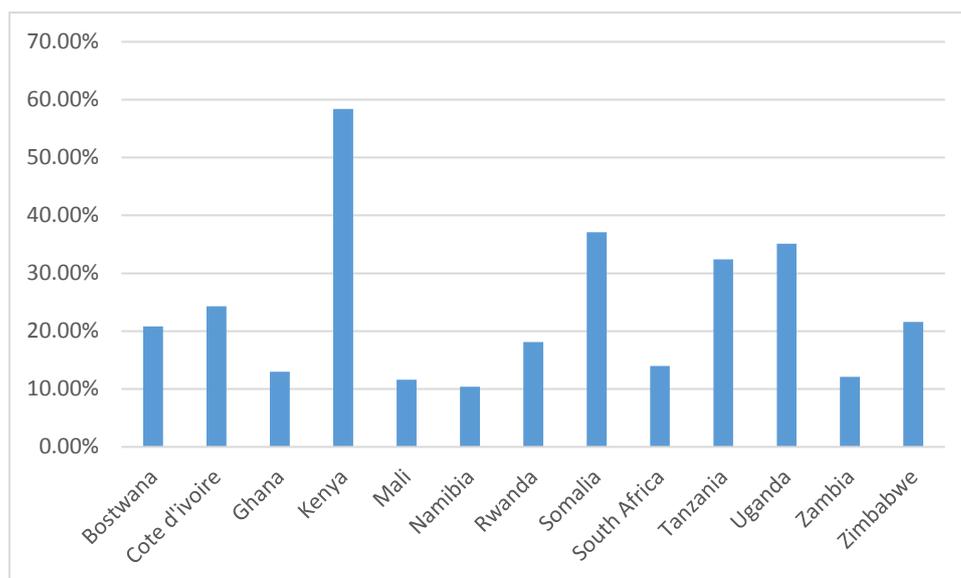
⁶⁹ Van den Berg (2014).

⁷⁰ Dzokoto (2013).

⁷¹ GMSA (2014), pp. 1-77.

⁷² Staschen (2015).

⁷³ Lee (2014).



Source: Data compiled from 2015 Findex Survey

The most important development that afforded the mobile money industry massive growth potential, is the introduction of network collaboration resulting in interoperability. This means that customers are allowed to transact across different mobile networks as well as across country borders. In April 2014 MTN Côte d'Ivoire and Airtel Burkina Faso entered into an agreement for interoperation in mobile money services. Thereafter Orange Côte d'Ivoire and Airtel Burkina Faso contracted in March 2015 to engage in a similar collaboration⁷⁴. MTN entered into an agreement with M-Pesa customers in Tanzania, the Democratic Republic of Congo (DRC), Mozambique and Kenya and MTN Mobile Money users in Uganda, Rwanda and Zambia established the first mobile money corridor in SSA allowing customers to transact across networks and countries. In May 2015 Vodafone M-Pesa and MTN Mobile Money agreed to allow customers the freedom to transfer funds between the two services. The development is a very strong incentive to bring more customers into the mobile money network and to enhance financial inclusion. Similar developments occurred in West Africa, where Orange operates an international money transfer service linking Côte d'Ivoire, Mali and Senegal. This facility quickly gained traction resulting in Orange money remittances to the value of nearly one-fifth of World Bank reported remittances between those countries⁷⁵. These developments are significant in illustrating the strength of the growing mobile money industry in countering former cultural distrust and scepticism about security, since customers actually see money being remitted and recipients benefitting from the transfer of funds.

7.- Discussion and policy implications

This article surveyed the status quo of mobile banking in SSA and highlighted the tremendous growth of mobile banking, especially in the East Africa region. The following key observations can be made with respect to the successful adoption of mobile banking. The lack of existing retail banking infrastructure has provided the opportunity for mobile banking to flourish. Furthermore the lack of regulatory restrictions, or the late introduction of elementary regulatory regimes, in many African countries, allowed for the rapid expansion of mobile banking, as the new developments were less restricted by rigid regulatory policies and legislation. Although traditional cultural barriers to trust in the use of mobile money

⁷⁴ GMSA (2015), pp. 1-73.

⁷⁵ GMSA (2014), pp. 1-77.

instruments still prevail, the impact of liberal market modernisation has contributed to changing these misconceptions. Lastly, the lack of fixed-line telecommunications together with the expanding mobile telecommunications networks has provided the gap in the market for the delivery of infrastructure required for mobile banking.

Mobile banking has provided easy access to financial services in the proximity of dispersed households whereby those formerly excluded have access to the formal banking sector. This is improved financial inclusion. The simplicity of the linkage with mobile communication technology has contributed to this penetration. In Kenya there is now a 75% account penetration and 58% of the population surveyed had a mobile money account. Kenya and South Africa are the African countries leading in the use of mobile banking as a means of providing access to financial services. Both countries have a mobile penetration of 10% or more and the highest number of adults with bank accounts as per the latest Global Findex Survey. Only 13 countries around the world have mobile money penetration of 10% or more. All of these countries are in SSA.

These countries used mobile banking to improve financial inclusion. The role of mobile money has been recognised across the world:

‘Mobile money has transformed the financial services landscape in many developing markets, both complementing and disrupting traditional “bricks and mortar” banking. By leveraging near-ubiquitous mobile penetration and building agent infrastructure, mobile money has introduced a high-volume, low-margin business model that can work for the mass market’⁷⁶.

The Global Findex data has shown that the account penetration across the globe has improved dramatically between 2011 and 2014, with a 20% drop in unbanked individuals and 700 million additional bank account holders. This change was attributed to the 13% improvement in account penetration in developing economies and the innovations in technologies, in particular mobile money that expanded financial inclusion in SSA. Kenya is now the leader in Africa in financial inclusion mainly because of the successful use of mobile banking. This is a remarkable feat considering that in the 2012, only 42% of adults in Kenya had a bank account. The visible impact of the innovations in payment and banking technologies on financial inclusion is clear as 63% of adults in the poorest of 40% of Kenyan households, now have a bank account. This figure was only 19% when the first Global Findex survey was conducted. East Africa is the leading region in mobile money adoption. In Kenya 58% of the adult population have a mobile money account followed by Somalia, Tanzania and Uganda. This article has highlighted that mobile banking can enhance financial inclusion and a future paper could empirically assess the degree to which mobile money is contributing towards financial inclusion.

The successes and failures of mobile money payments systems have highlighted the lessons to be learnt. In most of the African countries the lack of retail banking infrastructure together with the majority of the population unbanked, presented the most fertile ground for the widespread acceptance of mobile money services. The lack of formal banking infrastructure has always coincided with less regulatory restrictions and greater openness to new money technology. The exception is South Africa, where the sophisticated financial service sector complemented by an equally sophisticated regulatory system, poised two different interest groups against each other – formal banks with a high cost structure versus mobile money service providers that operated through digital networks, with a much less costly infrastructure. In order to ensure the success of mobile money adoption, network externalities need to be established (by attracting as many consumers and merchants as possible) whilst providing the convenience and efficiencies of other card payment methods. It is also key that financial

⁷⁶ GMSA (2015), p. 22.

institutions have strong relationships with merchants and mobile money agents to ensure sufficient transaction points to enhance market penetration. In some African markets the involvement of major banks was required by statutory regulation to facilitate mobile payments. In some markets this link was functional to the growth in the market, whilst in other markets the experience was varied. In Kenya, the lack of formal banking involvement in the market contributed to the innovative and dynamic development of the industry, while in Uganda and South Africa, these links proved less than optimal. In Tanzania, the absence of a well-developed formal retail banking sector hampered financial inclusion, but mobile telecommunication companies were able to significantly improve financial inclusion by competing in the mobile money industry.

Barriers to the success of mobile technologies, amongst others, are security concerns relating to loss of data and a personal information, and a reluctance of customers to adopt new technologies. This reluctance to engage with mobile money technology has a strong cultural base and has been observed to inhibit the initial decision to enter the industry. A preference for cash, which is still a reality in the world, together with two-thirds of the global population not utilising mobile banking, are strong barriers to widespread adoption. These barriers are gradually being overcome as the population is educated in the use of mobile technology and have experienced success with mobile transactions and the accompanying financial empowerment.

Regulatory systems developed for a sophisticated financial services sector or regulatory systems that do not provide for the delivery of financial services by any agent other than a formally registered bank, have proven to dampen the development of mobile money services. The mobile money industry has limitless growth opportunities in Africa, as it can provide the services needed more timeously, extensively and affordably than an industry dependent on costly fixed cost infrastructure. The higher the mobile money market penetration the more likely that transaction costs will be kept low. The important function of financial inclusion is economic empowerment – of ordinary people in managing their expenditure; for micro and medium sized businesses in facilitating their business transactions affordably; for people in the informal business environment in enabling cashless transactions which offer better security; and for the financial system at large in gradually introducing a growing portion of the population to financial services, such as credit. The access to credit is the most important economic empowerment mechanism to Africans responding positively to the opportunities of more open markets.

Of the three barriers to the successful operation of mobile money, the nature of the regulatory environment affecting market openness, is the key to successful bridging of the other two. In an enabling regulatory context, interoperability, that is the use of mobile payment technology across mobile networks and the facilitation of payments to non-users, will grow confidence in the technology and overcome the trust barrier. This is how financial inclusion is empowering the people in Africa. Another critical success factor is the expansion of the mobile network. There is also a need for a cohesive set of technology standards on which both customers and merchants can rely. An integrated, universal set of standards will allow for the widespread use of mobile payments, cross border acceptance and compliance convergence. Policies promoting competition in the telecommunications sector have resulted in innovative new technologies and allowed for the realisation of the associated cost savings. The policy, legislative and regulatory environment should be enabled to facilitate the entry of new players to the market and there needs to be certainty that this environment will remain enabling to new competitors or entrants without prejudice.

References

- ALLEN, Franklin, DEMIRGÜÇ-KUNT, Asli, KLAPPER, Leora & PERIA, María Soledad (2016): "The foundations of financial inclusion: Understanding ownership and use of formal accounts", *Journal of Financial Intermediation*, pp.1-30.
- ALLIANCE FOR FINANCIAL INCLUSION (2011): Global standard setting bodies and financial inclusion, available at: [http://www.gpfi.org/sites/default/files/documents/Global Standard Setting Bodies and Financial Inclusion.pdf](http://www.gpfi.org/sites/default/files/documents/Global%20Standard%20Setting%20Bodies%20and%20Financial%20Inclusion.pdf).
- AMIDŽIĆ, Goran, MASSARA, Alexander & MIALOU, Andre (2014): *Assessing countries' financial inclusion standing, A new Composite Index*.
- BECK, Thorsten (2015): "Cross-border banking and financial deepening: The African experience", *Journal of African Economies*, 24, pp.i32–i45.
- BECK, Thorsten & CULL, Robert (2013): "Banking in Africa", *Oxford Handbook of Banking*, Second Edition.
- BECK, Thorsten, Demirgüç-Kunt, Asli & LEVINE, Ross (2007): "Finance, inequality and the poor", *Journal of Economic Growth*, 12: 1, pp.27-49.
- BECK, Thorsten, SENBET, Lemma & SIMBANEGAVI, Witness (2015): "Financial inclusion and innovation in Africa: An overview", *Journal of African Economies*, 24: 1, pp.i3-i11.
- BRUHN, Miriam & LOVE, Inessa (2014): The real impact of improved access to finance: Evidence from Mexico, *The Journal of Finance*, 69: 3, pp.1347–1376.
- BURNS, Scott (2015): *Mobile money and financial development: The case of M-PESA in Kenya*, George Mason University.
- CARBÓ-VALVERDE, Santiago, MARQUES-IBANEZ, David & RODRÍGUEZ-FERNÁNDEZ, Francisco (2012): "Securitization, risk-transferring and financial instability: The case of Spain", *Journal of International Money and Finance*, 31:1, pp.80-101.
- CHO, Yoonyoung & TIEN, Bienvenue (2014): "Sub-Saharan Africa's recent growth spurt: An analysis of the sources of growth", *The World Bank*, Working Paper 6862, may.
- ČIHÁK, Martin, DEMIRGÜÇ-KUNT, Asli, FEYEN, Erik & LEVINE, Ross (2012): "Benchmarking financial systems around the world", *The World Bank*, Working Paper 6175.
- COSTELLO, Steve (2016): "Vodacom drops M-Pesa in South Africa", *Mobile World Live*, available at: <http://www.mobileworldlive.com/featured-content/top-three/vodacom-drops-m-pesa-in-sa/>, accessed may 19, 2016.
- DE GREGORIO, Jose & GUIDOTTI, Pablo (1995): "Financial development and economic growth", *World Development*, 23:3, pp.433-448.
- DE VOS, Dirk (2014): "Why mobile money is so tough to crack", *TechCentral*, available at: <http://www.techcentral.co.za/why-mobile-money-is-so-tough-to-crack/52418/>, accessed may 27, 2016.
- DELOITTE & TOUCHE (2014): "The future of telecoms in Africa - The "blueprint for the brave"", *Deloitte Market Review*.
- DEMIRGÜÇ-KUNT, Asli (2014): "Presidential Address: Financial Inclusion", *Atlantic Economic Journal*, 42:4, pp.349-356.
- DEMIRGÜÇ-KUNT, Asli, KLAPPER, Leora, SINGER, Dorothe & VAN OUDHEUSDEN, Peter (2015): "The Global Findex Database 2014: Measuring financial inclusion around the world", *The World Bank*, Working Paper 7255.
- DEMIRGÜÇ-KUNT, Asli & KLAPPER, Leora (2012a): "Financial inclusion in Africa: an overview", *The World Bank*, Working Paper 6088.
- DEMIRGÜÇ-KUNT, Asli & KLAPPER, Leora (2012b): *The Little Data Book on Financial Inclusion 2012*, *The World Bank*.
- DEMIRGÜÇ-KUNT, Asli & LEVINE, Ross (2008): Finance, financial sector policies, and long-run growth, *The World Bank*, *Development Research Group*, 4469, january.

- DHOLAKIA, Ruby Roy & DHOLAKIA, Nikhilesh (2004): "Mobility and markets: Emerging outlines of m-commerce", *Journal of Business Research*, 57: 12 Special issue, pp.1391-1396.
- DINIZ, Eduardo Henrique, Cernev, A.K. & DE ALBUQUERQUE, Joao Porto (2011): "Mobile money and payment: A literature review based on academic and practitioner-oriented publications (2001-2011)", *Proceedings of SIG Global Development Fourth Annual Workshop*. Shanghai, China, pp. 1-35.
- DOKU, James Ntiamoah, ABOR, Joshua, ADJASI, Charles Komla Delali & ANDOH, Charles (2013): "Banking sector developments in emerging markets: a review of recent developments in Africa", *Journal of Economics and Sustainable Development*, 4:17, pp.1999-2010.
- DUNCOMBE, Richard & BOATENG, Richard (2009): "Mobile phones and financial services in developing countries: A review of concepts, methods, issues, evidence and future research directions", *Third World Quarterly*, 30:7, pp.1237-1258.
- DZOKOTO, Vivian Afi (2013): "IMTFI Blog: Making sense of mobile money in urban Ghana: Personal, business, social, and financial inclusion prospects", *IMTFI*, available at: <http://blog.imtfi.uci.edu/2013/09/making-sense-of-mobile-money-in-urban.html>, accessed may 9, 2016.
- GMSA (2014): *2014 State of the Industry Mobile Financial Services for the Unbanked*.
- GMSA (2015): *2015: State of the Industry Report - Mobile Money*.
- GOLDSMITH, RaymondWilliam (1969): *Financial structure and development*, New Haven, Yale University Press.
- GOLDSTUCK, Arthur (2014): "Vodacom re-launches M-Pesa (again)", available at: <http://mg.co.za/article/2014-08-04-vodacom-re-launches-m-pesa-again>, accessed november 14, 2015.
- HONOHAN, Patrick (2008): "Cross-country variation in household access to financial services", *Journal of Banking & Finance*, 32:11, pp.2493-2500.
- INTERNATIONAL MONETARY FUND (IMF) (2016): "Financial Access Survey (FAS)", *Financial Access Survey*.
- INTERNATIONAL TELECOMMUNICATIONS UNION (ITU) (2016): "Mobile-cellular subscriptions", *International Telecommunications Union (ITU)*, available at: <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>, accessed may 20, 2016.
- JACK, William & SURI, Tavnet (2011): *Mobile money: The economics of M-Pesa*, Cambridge, Massachusetts, pp.1-31.
- JAMES, Jeffrey & VERSTEEG, Mila (2007): "Mobile phones in Africa: How much do we really know?", *Social Indicators Research*, 84:1, pp.117-126.
- KING, Robert & LEVINE, Ross (1993): "Finance and Growth: Schumpeter might be right", *The Quarterly Journal of Economics*, 108:3, pp.717-737.
- KLAPPER, Leora & SINGER, Dorethe (2015): "The role of informal financial services in Africa", *Journal of African Economies*, 24, pp.i12-i31.
- LEE, Annabel (2014): "The future of Uganda's mobile money market: Why agent networks are key to growing the sector", *NextBillion*, available at: <http://nextbillion.net/the-future-of-ugandas-mobile-money-market/>, accessed may 27, 2016.
- LEVINE, Ross (2005): "Chapter 12 Finance and Growth: Theory and Evidence", *Handbook of Economic Growth*, 1:SUPPL. PART A, pp.865-934.
- LEVINE, Ross (1997): "Financial development and economic growth: Views and agenda", *Journal of Economic Literature*, 35:2, pp.688-726.
- LEVINE, Ross (1998): "The legal environment, banks, and long-run economic growth", *Journal of Money, Credit and Banking*, 30:3, pp.596-613.
- MBITI, Isaac & WEIL, David (2011): *Mobile Banking: The impact of M-Pesa in Kenya*,

- available at: <http://www.nber.org/papers/w17129>.
- MCKINNON, Ronald (1973): *Money and capital in economic development*, by Ronald I. McKinnon, Brookings Institution, Washington.
- MULLINEUX, Andy & MURINDE, Victor (2014): "Financial sector policies for enterprise development in Africa", *Review of Development Finance*, 4:2, pp.66-72.
- PÉNICAUD, Claire (2013): "State of the industry: Results from the 2012 Global Mobile Money Adoption: Survey tables and figures", *GSMA, Mobile Money for the Unbanked*.
- PORTEOUS, David (2006): *The enabling environment for mobile banking in Africa*, Boston, available at: <http://www.bankablefrontier.com/assets/ee.mobil.banking.report.v3.1.pdf>.
- PORTEOUS, David (2008): *Mobile phone banking: Is m-banking advancing access to basic banking services in South Africa?*, Marshalltown.
- ROBB, Genna (2015): "Why mobile money has flopped in SA", *TechCentral*, available at: <http://www.techcentral.co.za/why-mobile-money-has-flopped-in-sa/58282/>, accessed may 27, 2016.
- SCHUMPETER, Joseph Alois (1934): *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle (translated from German by Redvers Opie)*, Mass, Harvard University Press, Cambridge.
- SHAW, EdwardStone (1973): *Financial deepening in economic development*, Oxford University Press, New York.
- SOUTH AFRICAN RESERVE BANK (2013): *Bank Supervision Department Annual Report 2013*, Pretoria, available at: [http://www.resbank.co.za/fastsearch/Pages/Results.aspx?sq=1&k=Bank Supervision Report](http://www.resbank.co.za/fastsearch/Pages/Results.aspx?sq=1&k=Bank%20Supervision%20Report).
- STASCHEN, Stefan (2015): "Mobile money moves forward in Uganda despite legal hurdles", *CGAP*, available at: <http://www.cgap.org/blog/mobile-money-moves-forward-Uganda-despite-legal-hurdles>, accessed may 27, 2016.
- SWAMY, Vighneswara (2014): Financial inclusion, gender dimension, and economic impact on poor households, *World Development*, 56, pp.1-15.
- TARRANT, Hilton (2015): "M-Pesa's a bigger flop in SA than Vodacom's letting on - Moneyweb", *Moneyweb*, available at: <http://www.moneyweb.co.za/moneyweb-opinion/m-pesas-a-bigger-flop-in-sa-than-vodacoms-letting-on/>, accessed may 27, 2016.
- THE WORLD BANK (2014): *Global Financial Development Report 2014: Financial Inclusion*, Washington.
- THE WORLD BANK (2016): World Development Indicators, *World Development Indicators*, available at: <http://data.worldbank.org/topic>, accessed may 25, 2016.
- VAN DER BERG, Regardt (2014): M-Pesa: Vodacom's money spinner in Tanzania. *TechCentral*, available at: <http://www.techcentral.co.za/m-pesa-vodacoms-money-spinner-in-tanzania/51290/>, accessed may 27, 2016.