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The economic impact of mobile banking on individual wealth in South Africa

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfillment of the requirements for the degree of Master of Business Administration.

07 November 2012

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Abstract

Mobile banking and access to mobile technologies have garnered a tremendous amount of interest, particularly in Africa, over the past decade. The race is one for both mobile network operators and financial institutions to take the high ground with various commercial models being implemented to leverage both the increasing demand for these services and emerging information and communications technologies, in order to maximise the potential business benefits.

The question that remains is if these products and services in banking and telecommunications, have managed to contribute towards the increase of personal wealth of individuals. In other words, has the scramble for mobile enabled payments and services only resulted in the wealth creation of organisation and governments, rather than contributing towards the consumers' lifestyle upliftment?

The research looks at the economic impact of mobile banking on individuals in developing countries, in particular, South Africa. This study is of a quantitative and descriptive in nature. The study looks at the movement of individual wealth indicators in particular gross domestic product per capita in line with the movement of customer registrations for mobile banking and subscriptions for mobile phones.

The research therefore looks at the different models used to facilitate mobile payments, whether bank led or mobile network operator led to establish if mobile banking is a facilitator of individual wealth creation.

Keywords

Mobile banking, individual wealth, mobile payments, Information and Communication Technology

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Signed:

Lambert Francois Gresse
07 November 2012

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1. Introduction to the research problem

1.1 Introduction

1.2 Research title

The economic impact of mobile banking on individual wealth in South Africa.

1.2.1 The economic impact of mobile banking on individuals

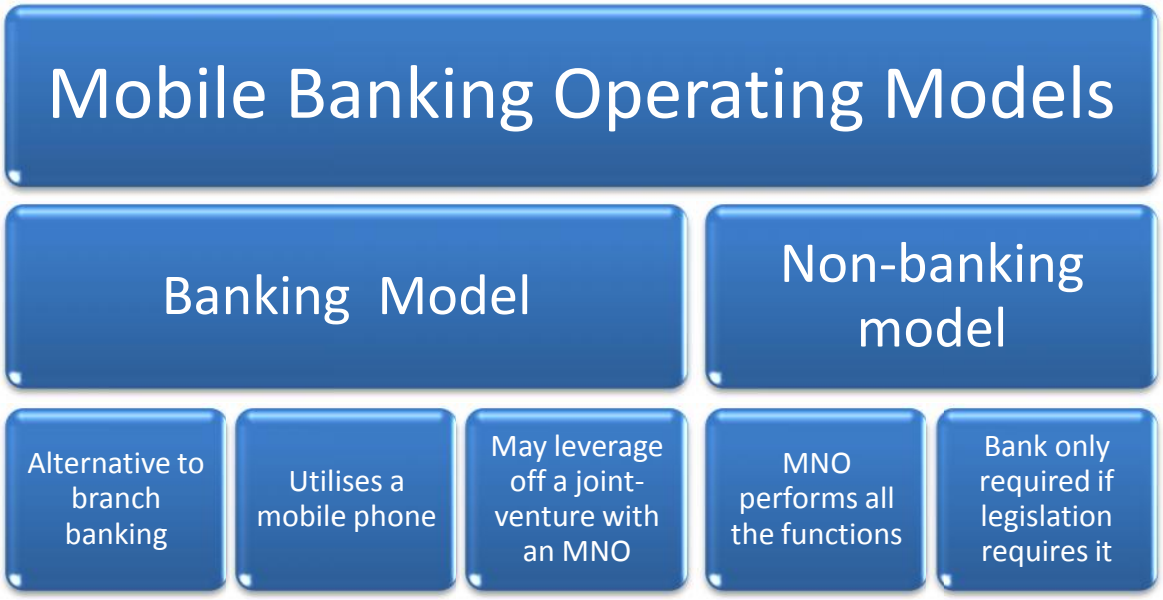
Mobile Banking (m-banking) is an aspect of banking associated with financial institutions, where the customer is dependant on a virtual service provided to them, by their financial institution where their transactional account is kept.

Kpodar & Andrianaivo (2011) defines m-banking services into two categories, namely additive or transformational. They specify that m-banking is an additive service where it is offered to customers over and above existing services and facilities which allow them to transact, for example an existing physical branch infrastructure. These are for the most part available in developed economies.

On the other hand they characterise transformational m-banking as existing usually in developing economies, where there is an absence of a branch banking footprint, essentially allowing for a concept know as branchless banking. The objective in this instance is to create financial inclusion for previously unbanked or under-banked individuals (Kpodar & Andrianaivo, 2011). Dittus & Klein (2011) describes financial inclusion as “providing basic financial services for the poor, while ensuring that the stability of the financial system is not compromised” (Dittus & Klein, 2011, p. 2).

Anyasi & Otubu (2009) suggested that m-banking can basically be divided into two models, depending on the organisation driving the service, in other words Mobile Network Operators (MNOs) or financial institutions (This is depicted in Figure 1 below).

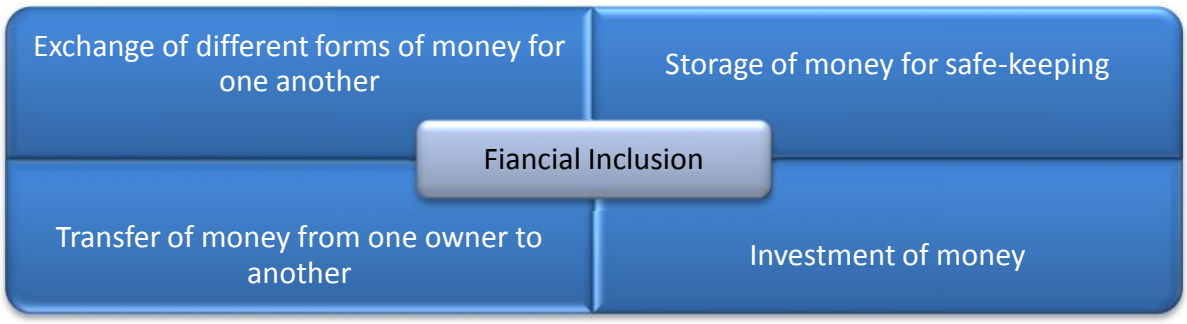
Figure 1: M-Banking operating models (Adapted from Anyasi & Otubu, 2009, p. 2)



Dittus & Klein (2011) highlighted the successes achieved through M-PESA in Kenya. M-PESA (a non-banking model) was developed by mobile network operator Safaricom, where "M" stands for mobile and "pesa" is Swahili for money. They argue that if the M-PESA model can be replicated in other countries, m-banking could become a primary catalyst of poverty alleviation, and will become a prominent feature for most financial institutions to offer their customers.

Dittus & Klein (2011) noted four key points, which indicates the basic building blocks that are required to ensure financial inclusion. (Refer to the Figure 2 below).

Figure 2: Building blocks for ensuring financial inclusion (Dittus & Klein, 2011, p.7)



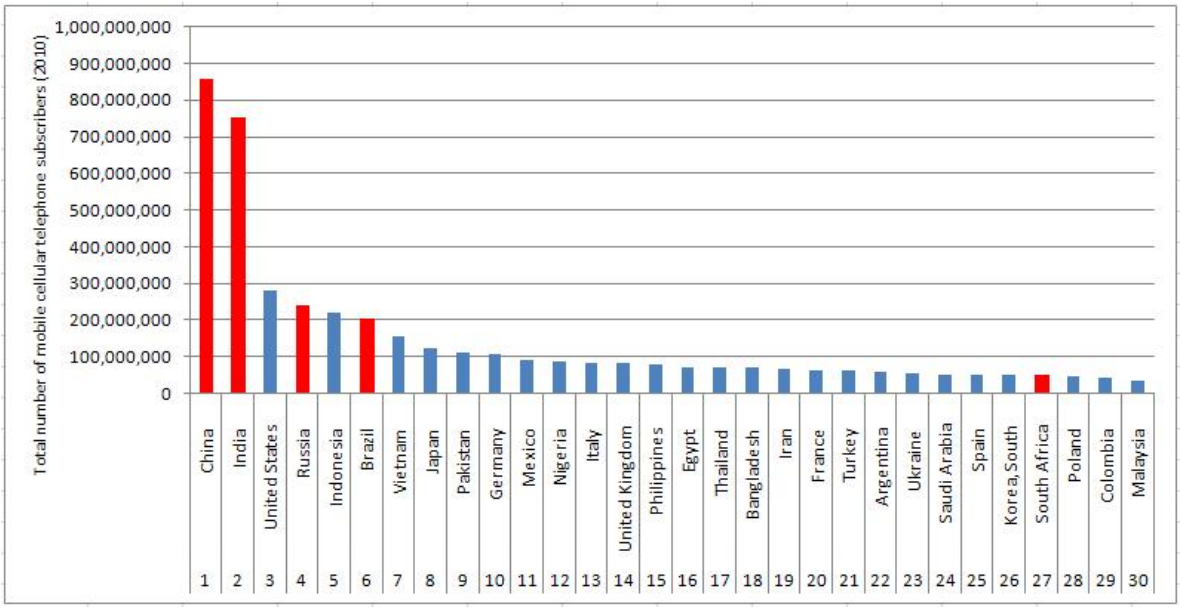
By evaluating the model according to the four points suggested by Dittus & Klein (2011), we can create an understanding of the fundamentals that would be needed to satisfy financial inclusion. It implies that money needs to be changeable from one form to another, it should be possible for a person to store the money for save keeping and also be able to receive returns on this investment of funds and finally a person must have the ability to transfer the money from one person to another. Financial inclusion therefore speak to access to basic financial services.

Access to basic financial services benefit the poor (Dittus & Klein, 2011) and m-banking benefits the poor particularly in African countries through financial inclusion, which in turn stimulates economic growth (Kpodar & Andrianaivo, 2011). There appears to be a correlation between access to m-banking services and the increase in household and individual wealth, through financial inclusion.

1.2.2 The economic impact of information and communication technology on individuals

Grace, Kenny, and Qiang (2003) defined Information and Communication Technology (ICT) as tools that facilitate the production, transmission and processing of information. It is therefore a broader term than just Information Technology (IT) and it emphasises the position of integrated communication infrastructures.

It includes general aspects of IT (hardware and software) as well as various types of broadcast media (both audio and visual) in an integrated framework to describe how users of ICT typically create and transmit data and information. Included in the framework of ICT, is that of mobile communications devices, which basically include fixed line and cellular phones, as well as any mobile or portable device that enables the user to communicate or transmit data between one another. Other examples of these devices would include tablets, notebooks and e-Readers.


Total number of mobile cellular telephone subscribers (2010)
1,000,000,000
900,000,000
800,000,000
700,000,000
600,000,000
500,000,000
400,000,000
300,000,000
200,000,000
100,000,000
0
China
India
United States
Russia
Indonesia
Brazil
Vietnam
Japan
Pakistan
Germany
Mexico
Nigeria
Italy
United Kingdom
Philippines
Egypt
Thailand
Bangladesh
Iran
France
Turkey
Argentina
Ukraine
Saudi Arabia
Spain
Korea, South
South Africa
Poland
Colombia
Malaysia
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

1.3 Research problem

There is strong evidence from the preliminary research to suggest that in order to create an environment that is conducive for creating financial inclusion and therefore, in turn, to increase wealth among individuals, a two-pronged approached is required that would consist of both an increase in access to m-banking facilities as well as an expansion in the ICT infrastructure of a country.

This research paper endeavoured to establish what is required in the environment of m-banking that will bring about the changes or acceleration of existing services, which will promote financial inclusion and possible wealth creation.

The research will therefore:

1. Establish how financial institutions, mobile network operators and governments can create environments to promote growth and expansion across the industries to the benefit of the individuals.
2. Verify the proposition that access to financial services, in particular m-banking, has increased individual wealth.
3. Verify the proposition that access to ICT and mobile subscription penetration in a country has increased individuals wealth and welfare.

1.4 Research scope

1.4.1 Mobile banking across Southern Africa

According to the United Nations (UN), the Southern Africa region can be defined as the countries located at the southern most regions in Africa. These countries include South Africa, Swaziland, Lesotho, Namibia and Botswana (Refer to Appendix four for a geographic representation of Southern Africa).

First National Bank (FNB) is a subsidiary of the FirstRand Bank Group. FNB is considered to be one of the leaders in the mobile banking space, having established cellphone banking as a means of transacting in South Africa in 2005. Subsequent to that, they have rolled-out this service to their subsidiaries in

Southern Africa. Typically, services are launched and rolled out in South Africa first, before it gets deployed to the rest of the continent where they have a footprint. The subsidiaries include:

- FNB Lesotho;
- FNB Swaziland;
- FNB Namibia;
- FNB Botswana;
- FNB Mozambique;
- FNB Tanzania;
- FNB Zambia.

FNB South Africa has also managed to be recognised as the most innovative bank in the world at the BAI-Finacle Global Banking Innovation Awards in October 2012 (First National Bank Ltd., 2012). This was largely attributed to the innovations they have implemented in the mobile banking industry. Examples of these innovations include Smartphone applications, eWallets on mobile phones and new mobile payments mechanisms for feature phones.

For the purpose of this study, the country under observation will be South Africa. The effect of the introduction of mobile banking will be established with the view of determining its impact on households and individuals measured as Gross Domestic Product per Capita (GDPPC) and to verify if a positive correlation exists between GDPPC and m-banking.

1.4.2 Interaction between mobile network operators and financial institutions

Anderson (2010) proposed that when infrastructure, products and services are combined to deliver a value proposition to users from a typical two-sided market, they are referred to as platforms. Rochet & Tirole (2006) define two-sided markets as markets in which end users are enabled to exchange information via a created

network by two or more organisations, through the use of their platforms. The aim of which is to charge the end-user appropriately on both sides with the view of generating profit, or at the very least not incurring a loss.

According to Eisenmann, Parker & Van Alstyne (2006), if these two-sided market networks are successful, they will spur a beneficial series of events where demand for the one will trigger and increase in demand for the other. Let us illustrate this with an example in the context of this study.

In the case of the banking industry in South Africa, it is necessary for the financial institutions to utilise the ICT infrastructure that has been put in place by the MNOs. This means that in order for the mobile banking customers to exchange information with their banks and for the banks to return requested information to their customers, they leverage off the MNO infrastructure. This means that the customer will pay a fee to use the network of the MNO, as well as paying a fee to the bank who may charge them for the requested transaction or piece of information. In some countries though, where legislation allows, MNOs can facilitate these mobile financial transactions on their own without the banks acting as a financial intermediary.

When M-PESA launched in Kenya, central bank legislation allowed them to operate independently from any financial institution. This was not the case in South Africa. The South African Reserve Bank (SARB) stipulates that any intermediary who wishes to conduct business in South Africa, with the aim of facilitating the movement and storage of financial values, needs to be sponsored by an accredited financial institution such as a bank.

When M-PESA launched in South Africa, it meant that M-PESA had to partner with a bank (Nedbank), for them to be able to roll out the M-PESA money transfer service into the market. This therefore created a two-sided market where both Nedbank and M-PESA (Vodacom) could stand to profit from.

In the context of South Africa, it is therefore necessary for financial institutions to partner with MNOs (or vice versa), should they wish to launch a joint m-banking application. This happens in the absence of them not being recognised by the SARB as an accredited financial institution. In turn, as the demand for m-banking grows among end-users in a market, so too does the demand for ICT infrastructure and mobile services in general.

Typically, as per Anderson (2010), a platform would be established. The two-sided model therefore creates not only growth in the two industries where banks and MNOs are concerned, but it delivers a product and service to its end-users and customers that may increase the individual's wealth and welfare as well.

1.5 Research motivation

1.5.1 The case for exploring mobile banking in Southern Africa

According to Bångens & Söderberg (2008), mobile technology achieved record figures through growth and development during the last couple of years. They found that it was becoming a primary vehicle to drive economic and social development.

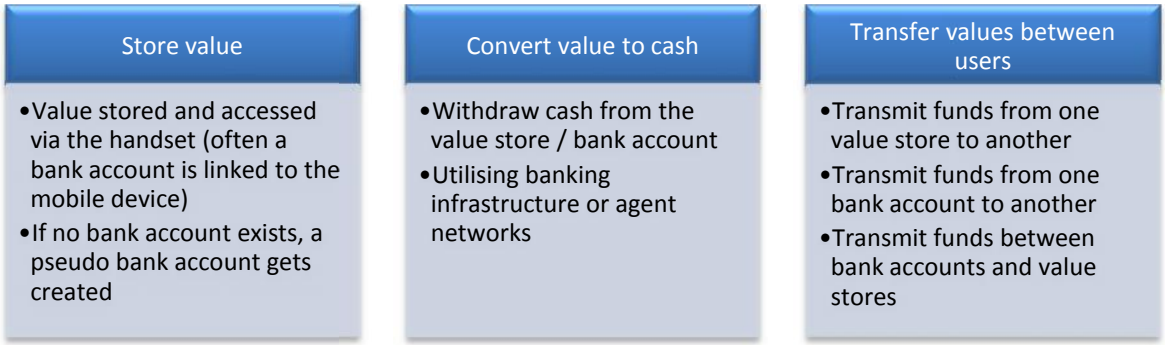
This is also highlighted in the latest African Mobile Factbook (2012) where it has been observed by industry researchers that the future of mobile technologies in Africa looks very promising over the long term. It has been observed that Africa is one of the key global growth areas and there are only a handful of other places where such large and plentiful opportunities exist. Reference is made to a gap between what ICT infrastructure and services are actually in place and what could be achieved with the latest technology (Blycroft, 2012).

In Africa the exceptionally high uptake of m-banking that has been observed, has also been noted when compared to similar trends of developed countries (African Mobile Factbook, 2012). This implies that m-banking has become a necessity in developing countries, where it otherwise is driven more by convenience in

developed nations. Again this proves the point made earlier, as noted by Kpodar & Andrianaivo (2011), that m-banking services can be divided into two categories, namely additive or transformational. The latter case hints at the fact that transformational models drive higher adoption of m-banking services in Africa, as they are fuelled by necessity.

M-banking often facilitates concurrent social and economic transactions through a mobile device (Anyasi & Otubu, 2009). They proposed that m-banking basically enables the user to perform three types of financial transactions (See Figure 4 for a depiction of the transaction types).

Figure 4: Transaction types created through m-banking (Adapted from Anyasi & Otubu, 2009, p.3-4)



These transactions enable a transformational environment to expand in the absence of physical banking infrastructures, both for MNOs and financial institutions. It is for this reason that m-banking should prove to play a pivotal role in the evolution and innovation of new products and services, that will undoubtedly affect the users of m-banking positively.

1.5.2 The case for exploring the interaction between mobile network operators and financial institutions

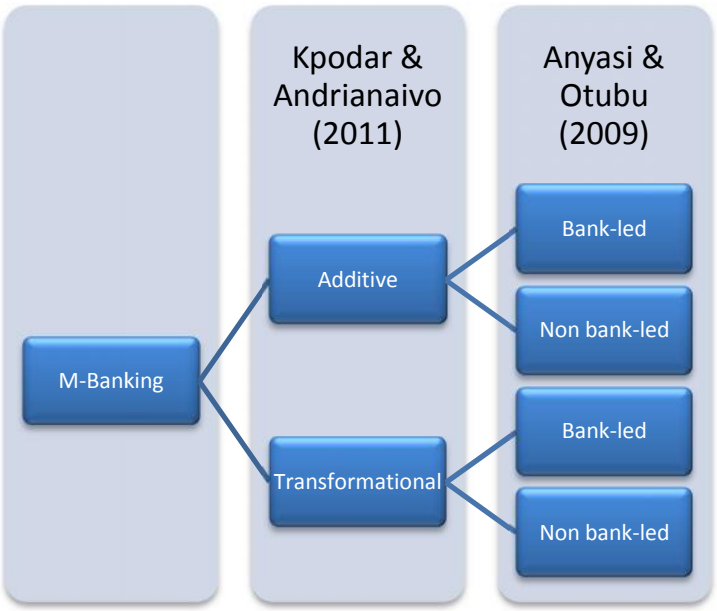
According to Anderson (2010), m-banking has the ability to provide basic financial services to unbanked and under banked customers in developing markets. This will result in a networked two-sided market between MNOs and financial institutions. Bångens & Söderberg (2008) argued that the prices for both handsets and mobile air-time are on a downward trend. The implication is that access to ICT services is becoming increasingly attainable by the poor due to its reasonable pricing.

This ICT trend could spur an increased demand in access to m-banking, when observing the two-sided market model. Globally, the number of bank accounts amounts to about one third of the number of mobile phones (Bångens & Söderberg, 2008). Mobile devices are therefore leap-years ahead of bank account in terms of availability to customers and end-users.

Kpodar & Andrianaivo (2011) suggested that by increasing the dispersion of mobile phones, an opportunity is shaped for the creation of conveniently accessible and affordable access to financial services. This would therefore imply that there exists a strong case for financial institutions to leverage off the expanding availability of mobile devices and its decreasing costs, resulting in financial inclusion for individuals and in turn, an increase in consumer welfare.

In support of this case, a combined review of Anyasi & Otubu's (2009) two proposed m-banking models and the proposed categories of Kpodar & Andrianaivo (2011) will be observed. (See Figure 5 for a graphic representation.)

Figure 5: A combined model based on the categories defined by Kpodar & Andrianaivo (2011) and the models proposed by Anyasi & Otubu (2009).



The aim of this approach is to establish whether there is indeed a successful case based on an additive versus a transformational approach, as well as the success or failure of bank-led models in the countries that will be observed. In this context, success would be defined as the creation of increased wealth of individuals and households, through the combined efforts of MNOs and financial institutions. Dittus & Klein (2011) suggested that the influence that developments in ICT can have is substantial provided that it is coupled with the correct business model for that country.

1.6 Structure of the report

Chapter 1:

In this chapter, the research problem, research scope and research motivation gets introduced. The objectives are defined and their relation to the research problem is explained.

Chapter 2:

An argument within academic literature is presented in this chapter to validate the need for the research. It investigates the crux of the research theme and problem in the South African context.

Chapter 3:

The research model and propositions are presented here. This chapter consist of three propositions, each with the aim of being proved or dispelled as part of the research.

Chapter 4:

The research methodology is presented, which is used to validate the propositions.

Chapter 5:

The results of the analysed data get listed.

Chapter 6:

The findings of the research results are discussed and provides an outcome and conclusion for the propositions made.

Chapter 7:

This chapter concludes the research paper and provides recommendations for future studies and business implications.

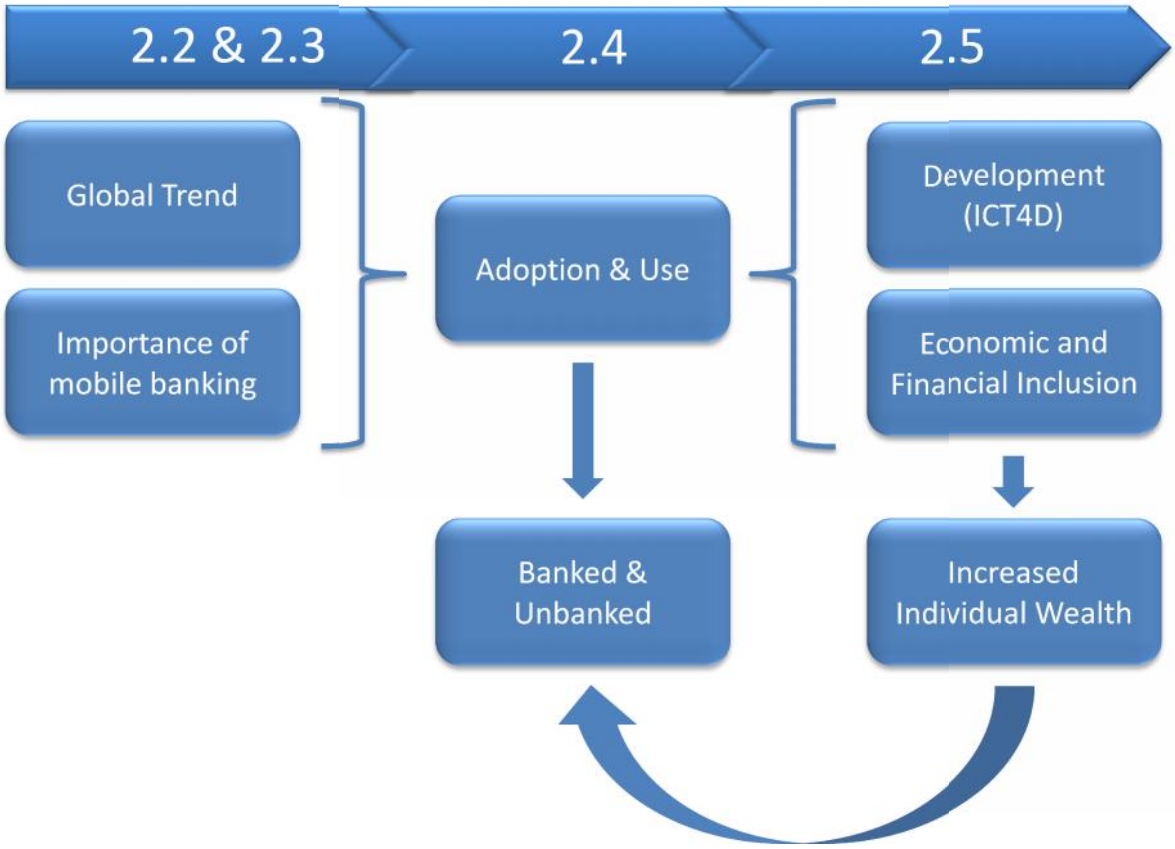
2. Relevant theory base

2.1 Introduction

The literature reviewed as part of this section of the paper, investigates central themes around the research problem. It aims to build the foundation around the importance of m-banking as a trend, rather than a fad and how individuals are adopting and using the technology.

Finally, we investigate the theory around the role that ICT plays in m-banking and development as well as the ultimate impact that it has on individuals and their wealth. Figure 6 below provides a graphical representation of the high-level themes of the literature that has been reviewed.

Figure 6: Graphic representation of the relevant theory base



2.2 Mobile banking as a global trend

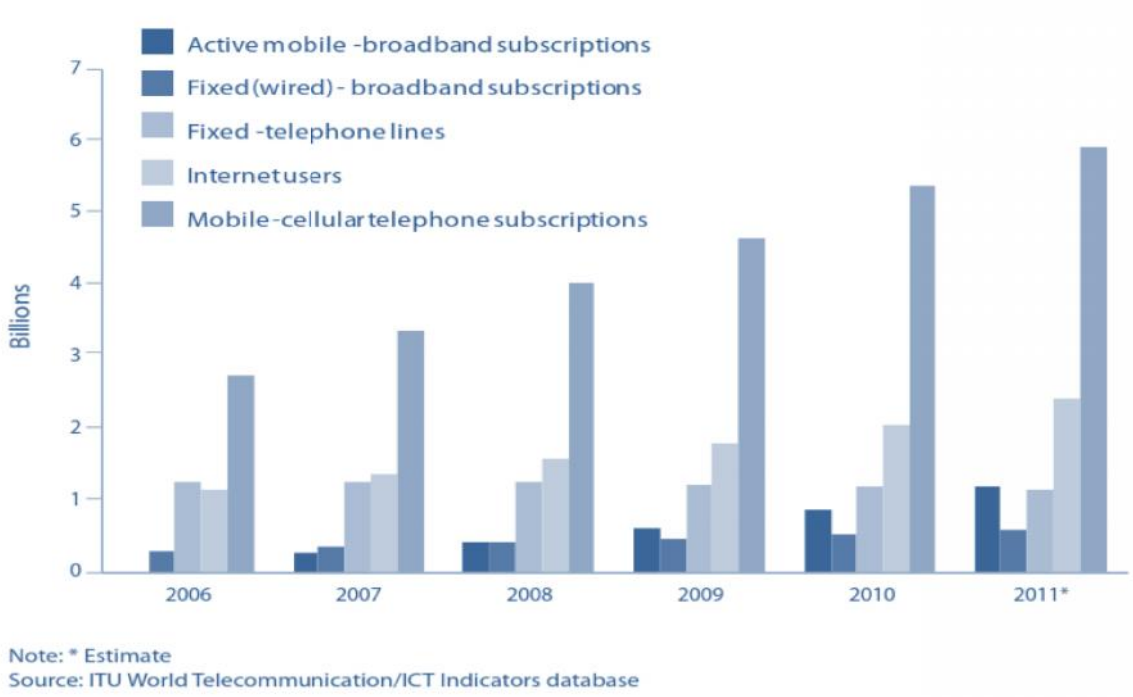
Donner (2008) argued that there is no single model that is applied globally to facilitate the movement of money via m-banking, but rather that the models are adjusted based on the specific requirements of that country. Every m-banking system in every country gets customised based on the relative importance of the functionality, based on individual needs per country. This may vary from beneficiary payments, cross-border remittances, access to financial information or the facilitation of person-to-person money transfers (Donner & Tellez, 2008).

The models that are provided for differ based on the institution driving the initiative. In other words the m-banking facility may either be driven by a bank or by an MNO (Porteous, 2006; Anyasi & Otubu, 2009). A trend that has been observed is that the popularity of m-banking is on the rise.

Pickens, Porteous, & Rotman (2009) estimates m-banking figures are on the rise globally. There are differences in the growth paths of different geographic areas, but they predict that in all cases the projected figures will by far have surpassed current volumes by 2020.

The International Telecommunication Union (ITU) projected that mobile-cellular subscriptions would have surpassed the 5.9 billion mark in 2011 already, with an estimated worldwide penetration rate of 87 per cent and 79 per cent in the developing world (International Telecommunication Union, 2011). Current estimates for South African mobile subscriptions in 2012 are projected around the 64 million active subscriber mark. Figure 7 below illustrates the projected growth rate for 2011, and illustrates the expected continued growth in mobile subscribers.

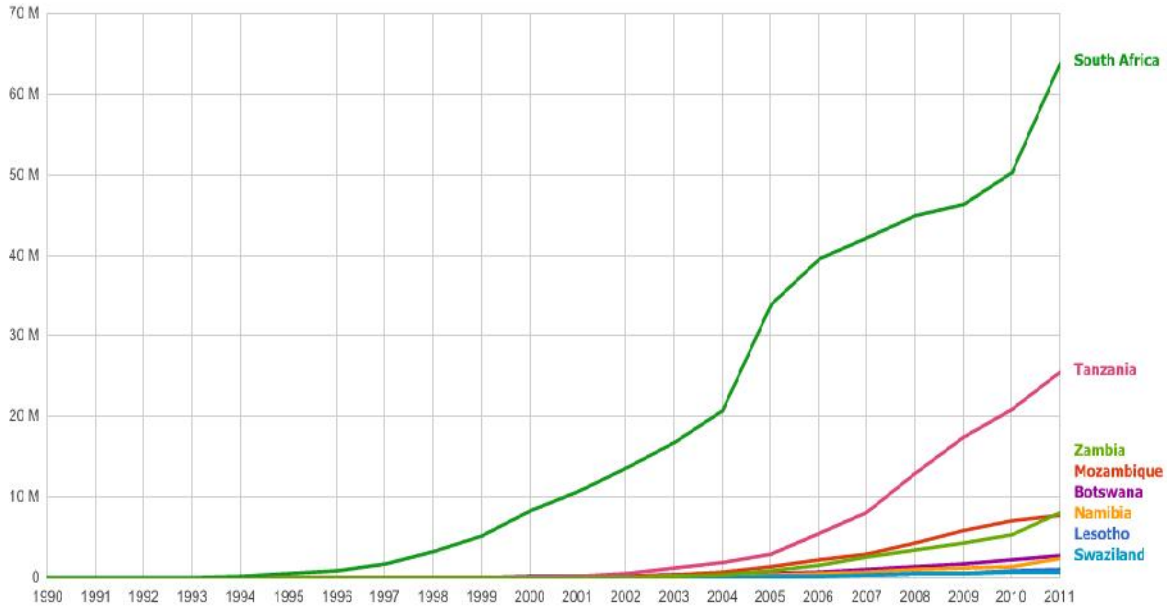
Figure 7: Global mobile subscription growth rates (ITU, 2011)



Note: * Estimate
Source: ITU World Telecommunication/ICT Indicators database

Similarly to the global trend, Southern African countries including Lesotho, Swaziland, Namibia, Botswana, Mozambique, Tanzania, Zambia and South Africa has also show tremendous growth as illustrated in Figure 8.

Figure 8: Mobile subscription growth in Southern African countries (ITU, 2011)

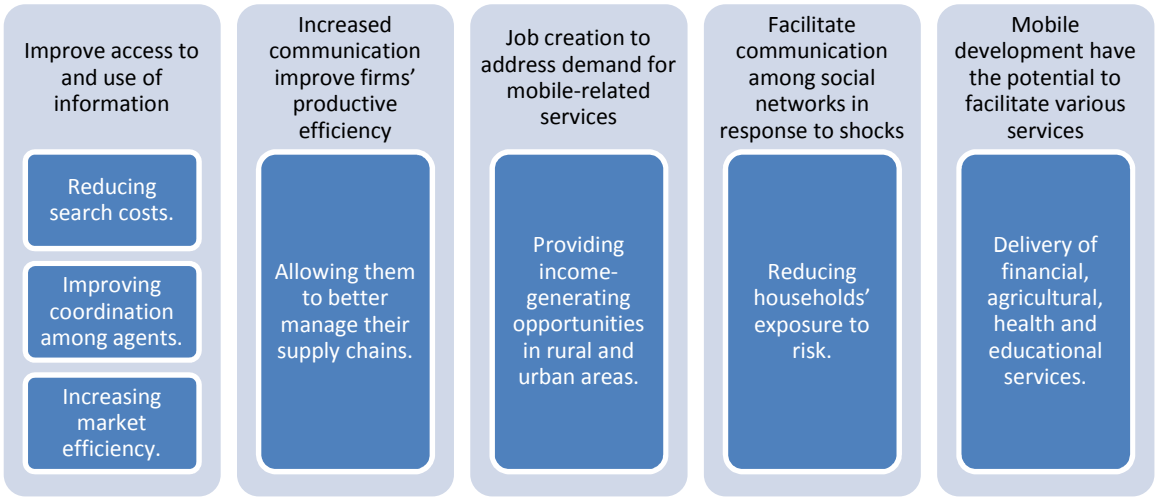


2.3 The importance of mobile technologies in banking

Mobile banking has one key advantage as a delivery platform. It can utilise several different protocols and technologies to deliver basically the same service to fulfil the end-user needs and requirements. Tiwari & Buse (2007) described the following as the most popular applications being used to deliver m-banking services to customers. They noted the main application types as being browser-, messaging and client based applications (Tiwari & Buse, 2007, pp. 83 – 103). Table 1 below depicts a breakdown of the typical platforms and phone types are required to deliver the different types of applications to the end-user.

Table 1: Comparison between technologies, platforms and applications for mobile phones

	Browser Based Applications	Messaging Based Applications	Client Based Applications
Technology / Platform	Wireless Application Protocol (WAP)	Unstructured Supplementary Service Data (USSD) & Short Message Service (SMS)	Sim Toolkits (STK) & Java based Applications (Smartphone App's)
Types of phones	Feature phones or Smart phones with the ability to connect to the internet.	Any GSM phone with text messaging and voice capabilities.	Smart phones such running on platforms such as Apple iOS, Android and Windows Mobile.
Popular phone examples (not comprehensive, illustrative only)	Nokia E75, Samsung e720, iPhone 3 & 4	All Smart phones, & feature phones, Nokia 2110, Motorola 8700	Apple iPhone 4, 4s & 5, Samsung S3, HTC One X


Improve access to and use of information
Reducing search costs.
Improving coordination among agents.
Increasing market efficiency.
Increased communication improve firms' productive efficiency
Allowing them to better manage their supply chains.
Job creation to address demand for mobile-related services
Providing income-generating opportunities in rural and urban areas.
Facilitate communication among social networks in response to shocks
Reducing households' exposure to risk.
Mobile development have the potential to facilitate various services
Delivery of financial, agricultural, health and educational services.

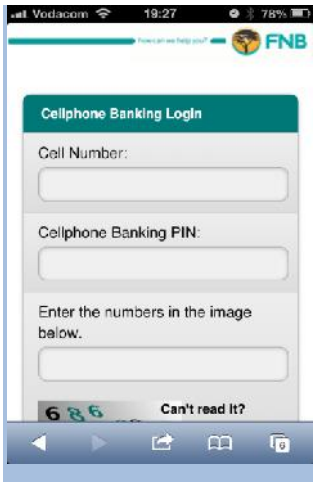
3. It leverages alternative distribution networks for the dissemination of cash, rather than just leveraging conventional banking infrastructure such as automated teller machines (ATM's) and point-of-sale (POS) devices;
4. It may be more affordable that traditional banking.

"The extent to which mobile banking will in fact be transformational in a country will depend in a large measure on whether the environment is enabling" (Porteous, 2006, p.4). This statement by Porteous (2006) suggests that it does not necessarily exclude bank-led models in m-banking from being transformational in nature, but rather depends on the banks' ability to leverage and exploit the infrastructure available in that country.

2.4 The use of mobile technologies and m-banking by the banked and unbanked

Feature phones have been found to still be the predominant phone type of choice for Africans, largely due to cost and capabilities. Nokia continues to dominate with over 50 per cent market share among users aged 16 and above, despite their globally declining footprint (Mobility 2012, 2011).

It is for this reason that FNB has a large base of cellphone banking users, still relying on Unstructured Supplementary Service Data (USSD) to perform m-banking transactions as opposed to Smartphone applications and Wireless Application Protocol (WAP), which both require a 3G, wireless broadband connection or similar in order to transmit data. Table 2 below represents the methods currently utilised to access m-banking at FNB.

	WAP	USSD	APPLICATIONS
Access	www.fnb.mobi via web browser on a feature phone or smart phone	Dialling *120*321# using any cellphone	Downloading an accessing the application via Smart phone
% of base utilising this as the primary means of cellphone banking	30%	60%	10%
Access page example			

majority of a country's poor people have access to mobile phones, which plays an integral part in creating inclusive financial systems. There is also an increasing dependence on the use of the technologies that mobile phones provide, such as text messaging. The technology offers an opportunity to operate virtual bank accounts with minimal infrastructure investments (Helms, 2006, p.115). This is especially important in developing countries where typical bricks and mortar infrastructure is under developed or missing and often creates possibilities for financial exclusion.

Demirgüç-Kunt & Klapper (2012) was of the opinion that inclusive financial systems empower impoverished people to focus on savings and borrowings, enabling them to build assets, grow their investments and improve their education levels thereby allowing them to ultimately start business ventures. This in turn leads to enhanced levels of livelihood.

They continued to maintain that inclusive financial systems allowed a country's poor to smooth their expenditure and insulate themselves against many social and economic uncertainties ranging from ill health to unemployment (Demirgüç-Kunt & Klapper, 2012). Mobile banking as part of an inclusive financial system may therefore allow for an increase in personal wealth of an individual.

When looking at the reach of mobile telephony as opposed to other forms of ICT such as the internet, mobile technologies have outshone them by a wide margin. This can largely be attributed to the rapid pace and extent to which mobile technology can reach poor communities in remote areas of in developing countries (Klonner & Nolen, 2008).

Aker & Mbiti (2010) claimed that the growth in mobile phones in Sub-Saharan Africa brought with it several advantages to the end-user. They argued that mobile phones held cost benefits, provided immediate access to information, enabled active user participation and provided greater accessibility. These advantages

ultimately stand to benefit all citizens of a country, but in particular the country's poor.

Collins, Morduch, Rutherford & Ruthven (2009) made the observation that more than 40 per cent of the world are defined as being poor, due to the fact that they live on less than two dollars per day. "A daily income of less than two dollars per person has become a widely recognised benchmark for defining the world's poor. The World Bank counted 2.5 billion people in this category in 2005—two-fifths of humanity. Among these 2.7 billion, the poorest 1.1 billion were scraping by on less than one dollar a day" (Collins *et al*, 2009, p.1).

When observing the latest data available from The World Bank (2011), the information in Sub-Saharan Africa unveils a similar picture, with the exception of South Africa, Botswana and Namibia. Refer to Figure 10 and Table 3 below.

Figure 10: Poverty headcount ratio in Sub-Saharan Africa (The World Bank, 2011)

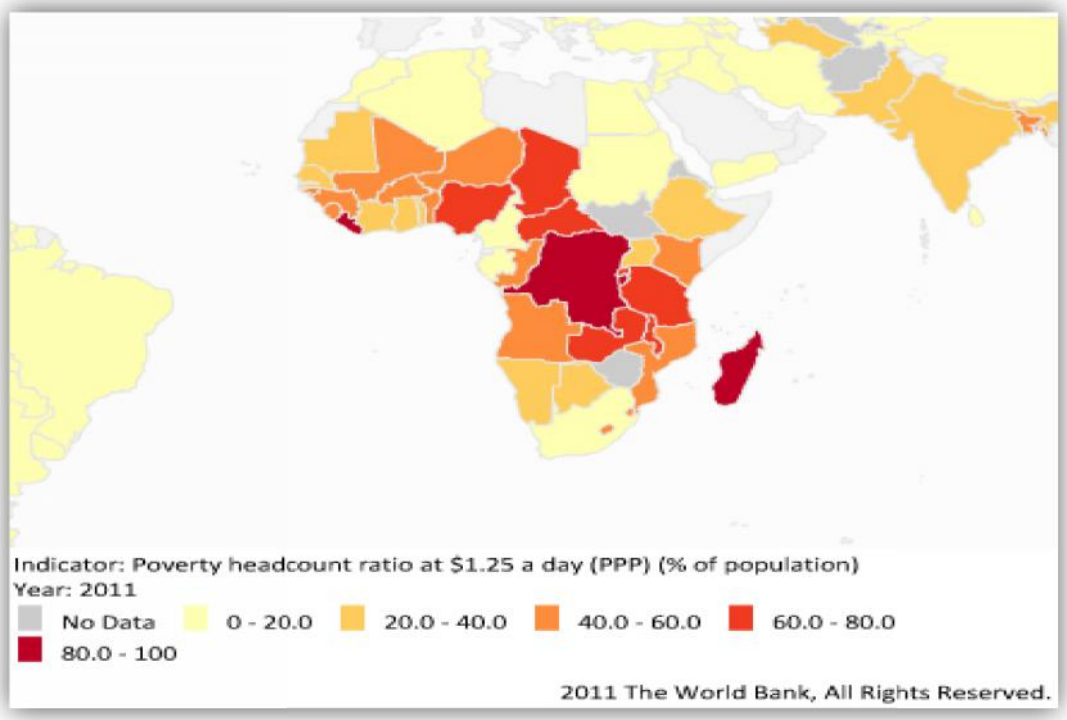


Table 3: Percentage of Sub-Saharan African population living on less than $1.25 per day (The World Bank, 2011)

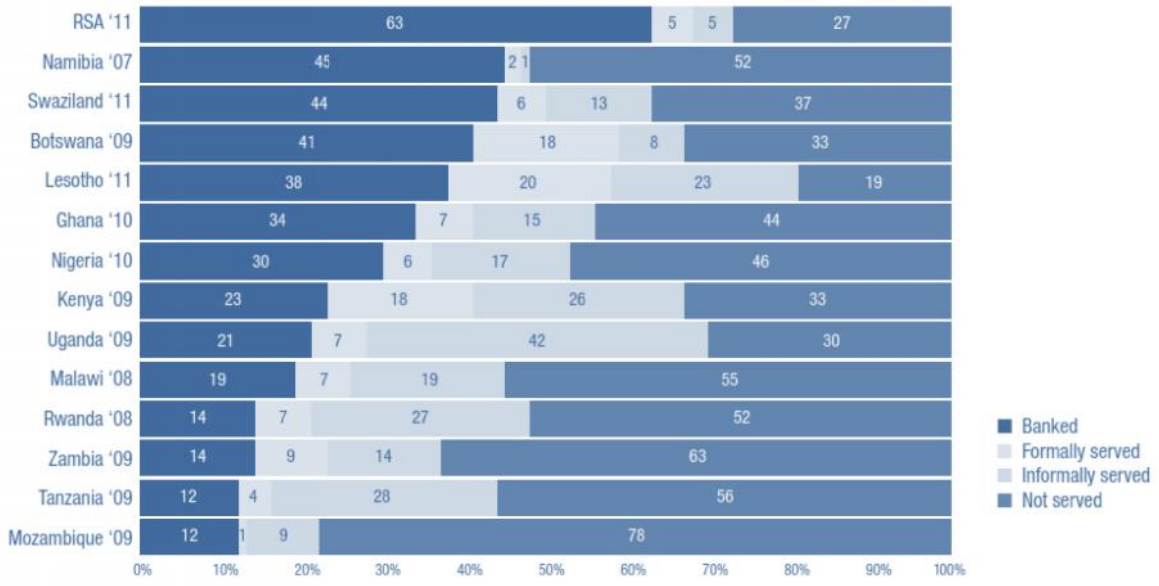
Country	% of population
South Africa	13.77
Botswana	31.23
Namibia	31.91
Swaziland	40.63
Lesotho	43.41
Mozambique	59.58
Tanzania	67.87
Zambia	68.51

The significant difference in the South African figures as represented in Table 3, when compared to other Sub-Saharan African countries, may be attributed to the sound ICT infrastructure of the country.

Klonner & Nolen (2008) observed that South Africa may be classified as a success story of ICT. They contended that this was especially true, given the large scale efforts by mostly the private sector to enable that mobile network without any significant public expenditure (Klonner & Nolen, 2008). Private MNO firms may therefore have unintentionally created a platform for inclusive banking.

Figure 11 is a representation of the percentage of the populations observed by a FinMark Trust study during 2011, depicting financial inclusion per country. It reveals that South Africa has the highest number of banked customers in Southern Africa, with only about one third not being financially included.

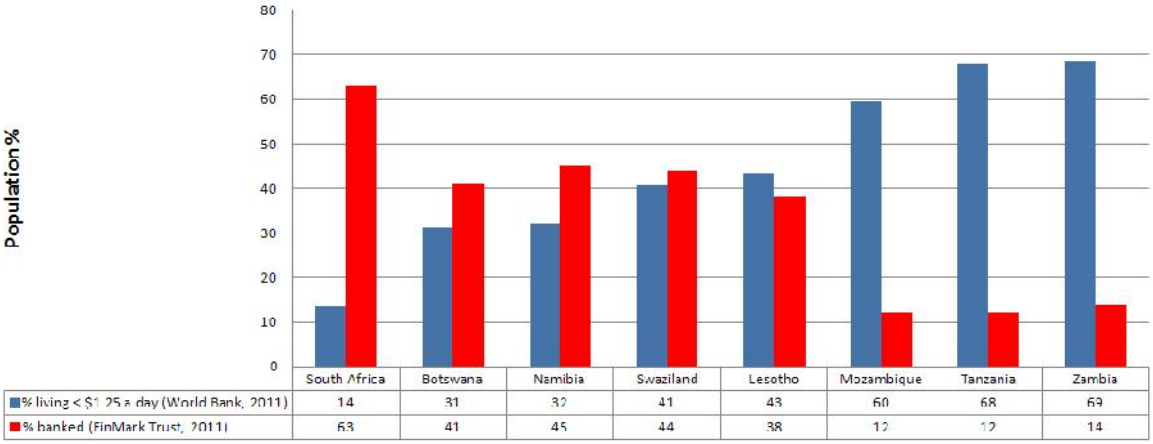
Figure 11: Financial inclusion in Africa (FinMark Trust, 2011)



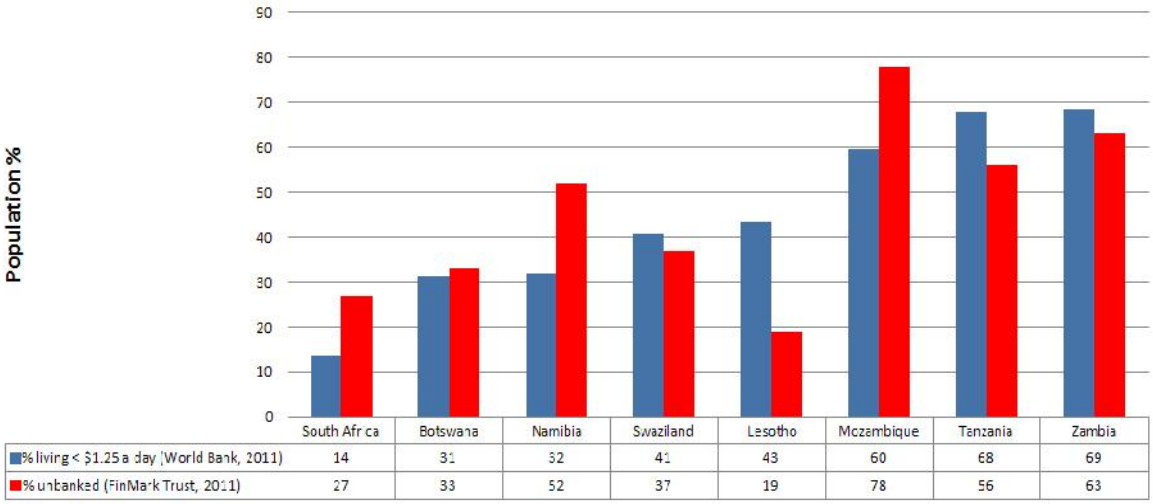
To put this into context, a comparison between The World Bank and FinMark Trust results were made (The World Bank, 2011; FinMark Trust, 2011). The results are represented in Figures 12 and 13 below.

First, a comparison was made between the percentages of the specific country's population considered to be "poor" as per the earlier definition, versus the percentages of the same country's population that is considered to be banked. What has been observed is that there seems to be an inverse relationship between poverty and financial inclusion.

It would seem that the greater the amount of people living on less than $1.25 a day there are in a country, the lower the number of people would be who are financially included. This has been depicted in Figure 12 below.



	South Africa	Botswana	Namibia	Swaziland	Lesotho	Mozambique	Tanzania	Zambia
% living < $1.25 a day (World Bank, 2011)	14	31	33	41	43	60	68	69
% banked (FinMark Trust, 2011)	63	41	45	44	38	12	12	14



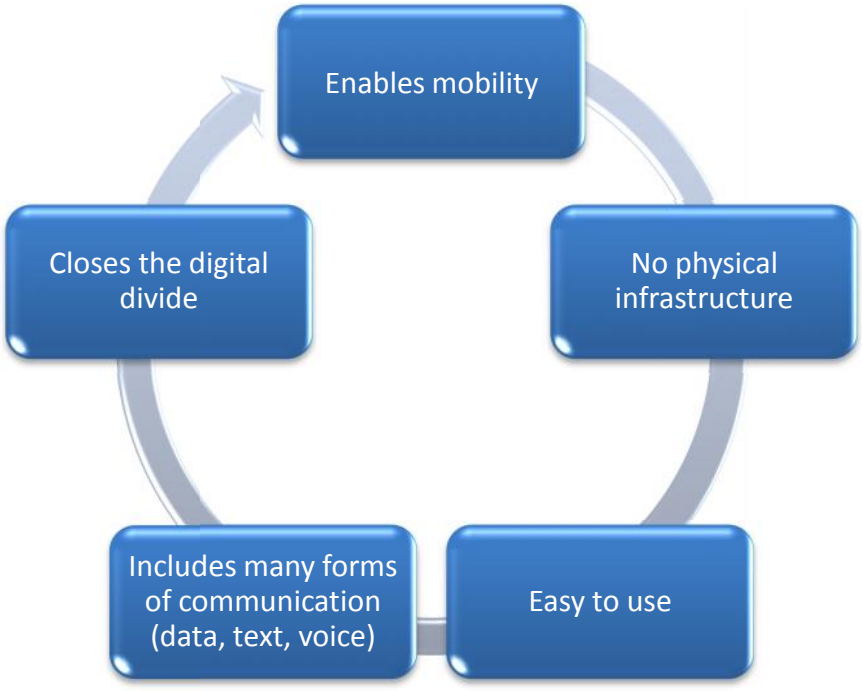
	South Afr ca	Botswana	Namibia	Swaziland	Lesotho	Mozambique	Tanzania	Zambia
% living < $1.25 a day (World Bank, 2011)	14	31	32	41	43	60	68	69
% unbanked (FinMark Trust, 2011)	27	33	52	37	19	78	56	63

for development. Characteristics that have been proposed by them in support of their view included mobility, lack of dependence on physical infrastructure, ease of use and understanding, the capability to use several means of communication ranging from data, text and voice and finally affordability (Rashid & Elder, 2009).

Another reason that has been cited by James & Versteeg (2007) as mobile technologies being an important contributor to development is the absence of fixed-line infrastructure. A popular view is that mobile phones and their applications have the ability to close the digital divide, in particular in Africa (James & Versteeg, 2007).

The characteristics of mobile technologies and their ability to be a catalyst for development is summarised in Figure 14 below.

Figure 14: Mobile technologies and their characteristics that enable development (James & Versteeg, 2007; Rashid & Elder, 2009)



This sentiment was also echoed by a study conducted by Deloitte for the GSM Association. In the report they state that an increase of 10 per cent in mobile phone penetration will elevate that particular country's growth rate with 1.2 percentage points (Deloitte, 2007).

Alampay & Bala (2010) argued that within the context of ICT4D, m-banking and mobile money is primarily concerned with reaching the unbanked and individuals at the BoP (Alampay & Bala, 2010). Bångens & Söderberg (2008) said that the unbanked are for the most part rural, poor people trying to make a living in largely cash-based and informal economies.

The result is that their income levels fluctuate, mainly due to occasional jobs, seasonal trends in agriculture and the frequency of welfare payouts. They continued to maintain that the unbanked had a willingness to adopt new technologies as long as they meet their real needs, which included m-banking solutions (Bångens & Söderberg, 2008).

Following on the aforementioned, Alampay & Bala (2010) maintained that the limited access to established physical financial channels such as bank branches and card-based infrastructure required the unbanked to use virtual technologies to facilitate their varying forms of cash flows, such as m-banking. The need is therefore created to establish mechanisms that allow for greater financial inclusion in societies and countries.

2.6 The academic case for this study

- The research will combine the models proposed in existing literature, which claims to be either additive or transformational (Kpodar & Andrianaivo, 2011), or bank-led versus non-bank led (Porteous, 2006; Anyasi & Otubu, 2009), and the benefit to the individuals in a South African context.
- Explore the two-sided markets in South Africa, created with the aim of collaboration between MNOs and financial institutions, to the benefit of the organisations involved and the customer (Anderson, 2010; Eisenmann *et al*, 2006; Rochet & Tirole 2006).

An opportunity therefore exists to:

- Evaluate if the introduction and adoption of mobile technologies in a country has produced a measurable change in the individual welfare of those societies.
- Examine if the further introduction and adoption of m-banking in the country has contributed towards the welfare of individuals in society.
- Determine if there is a correlation between the adoptions of mobile technologies versus the adoption of m-banking.
- Measure the observed trend changes in individual welfare over time, resulting from the adoption of mobile technologies and m-banking, while comparing this country-by-country across the Southern African region in the context FNB.

3. Research propositions

3.1 Proposition 1: The introduction of mobile technology results in an increase in individual wealth of a person in that country.

The objective is to prove that there exists a relationship or correlation between the time when mobile phone and communication technologies was first introduced in South Africa and the individual wealth of a person in that country. The aim is to measure the increase in the mobile phone subscriber base, with the expected increase in GDPPC.

3.2 Proposition 2: The introduction of m-banking results in an increase in individual wealth of a person in that country.

The objective is to prove that there exists a relationship or correlation between the time when mobile banking at FNB was first introduced to South Africa and the individual wealth of a person in that country. The aim is to measure the increase in the mobile banking registered base, with the expected increase in GDPPC. The mobile banking base that will be used is, will be ring-fenced to that of the FNB base.

3.3 Proposition 3: The combined effect ICT and financial institutions, resulting in two-sided markets, creates a cumulative positive impact across all countries observed for the Southern African region.

The objective is to prove that there exists a combined relationship or correlation between the time when mobile communication technology and mobile banking was first introduced in South Africa and the individual wealth of a person in that country. The aim is to measure the increase in the mobile phone subscriber and mobile banking registered base, with the expected increase in GDPPC. The mobile banking base that will be used is, will be ring-fenced to that of the FNB base.

4. Research methodology

4.1 Choice of methodology

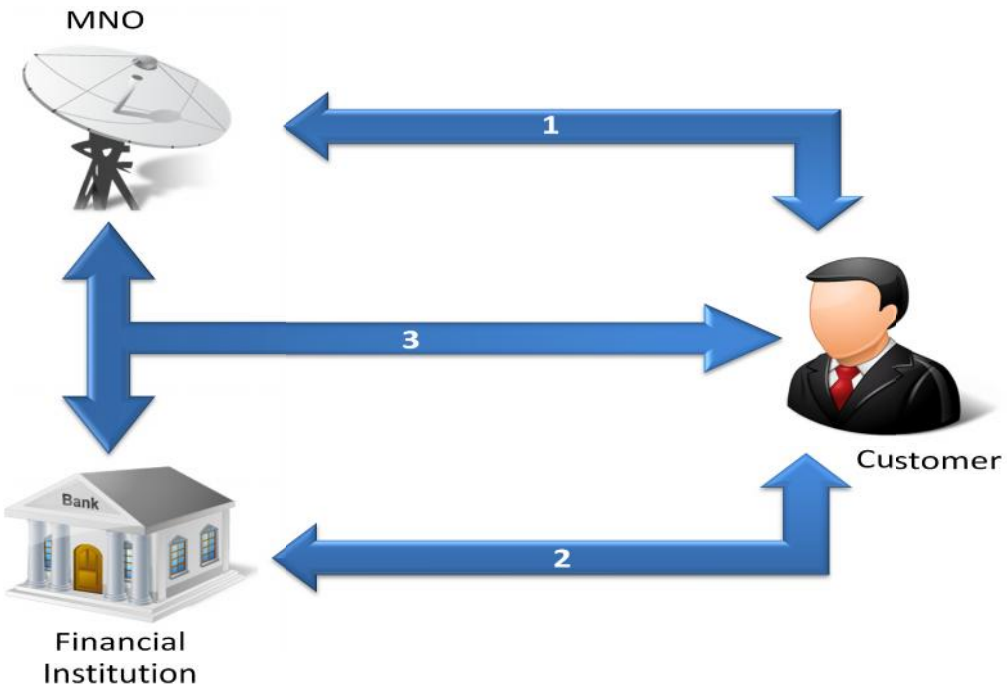
This study will be quantitative and descriptive in nature. Saunders & Lewis (2011) describes descriptive studies as "research designed to produce an accurate representation of persons, events or situations" (Saunders & Lewis, 2011, p. 111).

In this study, the reanalysis of secondary data will be done for South Africa. The chosen methodology will explore the study through guiding questions in the form of who, what, when, where and how.

4.2 Scope and unit of analysis

The following model depicts the scope within which data will be gathered and the appropriate inferences be made.

Figure 15: Scope of the research



The study will therefore enquire as per the propositions and the model above, the following aspects:

1. The introduction of mobile technology results in an increase in individual wealth of a person in South Africa, as measured by GDPPC in comparison the mobile technology usage and subscription in the country;
2. The introduction of m-banking results in an increase in individual wealth of a person in South Africa, as measured by GDPPC in comparison to the mobile banking registered base at FNB in the country;
3. The combined effect ICT and financial institutions, resulting in two-sided markets, creates a cumulative positive impact across all countries observed for the Southern African region.
    a. As measured through the combined comparison of 1 and 2 above;

The unit of analysis is therefore the movement in the associated measurement of a person's wealth within that country, as result of the usage of mobile technologies, m-banking or both.

4.3 Population

The population consist of the MNOs and their subscriber base as well as FNB and their associated registered m-banking customers. The table below illustrates the population sample:

Figure 16: Table depicting the population to be observed under the study

	MNOs	Financial Institution	Customers
South Africa	• Vodacom • MTN • Cell C • 8ta	FNB South Africa	• Customers utilising MNO services • Customers registered for cellphone banking

4.4 Sample size and method

The sample size will be equal to the entire registered base at the time of observation in the study. This is dependant on the year-on-year number of registered customers both at the MNO and FNB South Africa. It has the benefit that a larger population can be observed as the data is readily available.

The table below is an indication of the total number of registered FNB Cellphone Banking customers across Southern Africa:

Figure 17: Number of register FNB Cellphone banking customers in Southern Africa (Sept 2012)

Country	Number of registered cellphone banking customers
South Africa	3, 648, 704

The table below is an indication of the total number of registered MNO subscribers across South Africa:

Figure 18: Number of MNO subscribers (CIA Factbook, 2011)

Country	Number MNO subscribers
South Africa	64,000,000

4.5 Data gathering process and research instrument

Secondary data was utilised to perform the analysis. Data was readily available from FNB. Data for MNOs was obtained through credible external sources such as the Mobile Africa Factbook, CIA Factbook and the World Bank.

4.6 Method of analysis

Proposition 1: Linear Regression Analysis

- **The introduction of mobile technology results in an increase in individual wealth of a person in South Africa.**
  - Dependant variable: Gross Domestic Product per Capita (GDPPC)
  - Independent variable: Number of MNO subscribers

Proposition 2: Linear Regression Analysis

- **The introduction of m-banking results in an increase in individual wealth of a person in South Africa.**
  - Dependant variable: Gross Domestic Product per Capita (GDPPC)
  - Independent variable: Number of register m-banking customers at FNB

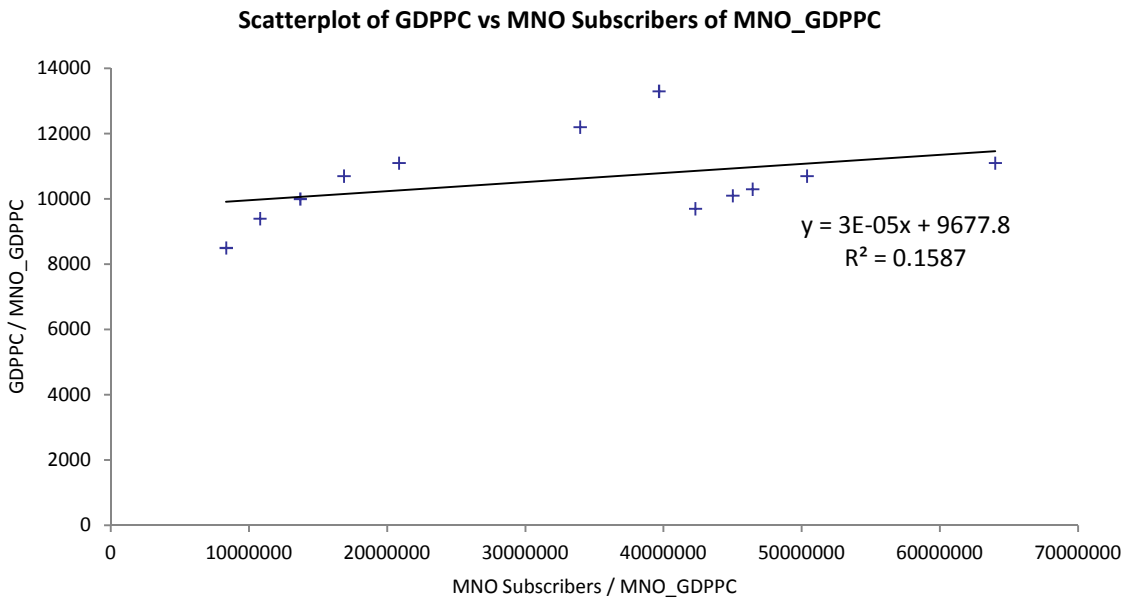
Proposition 3: Multiple Regression Analysis

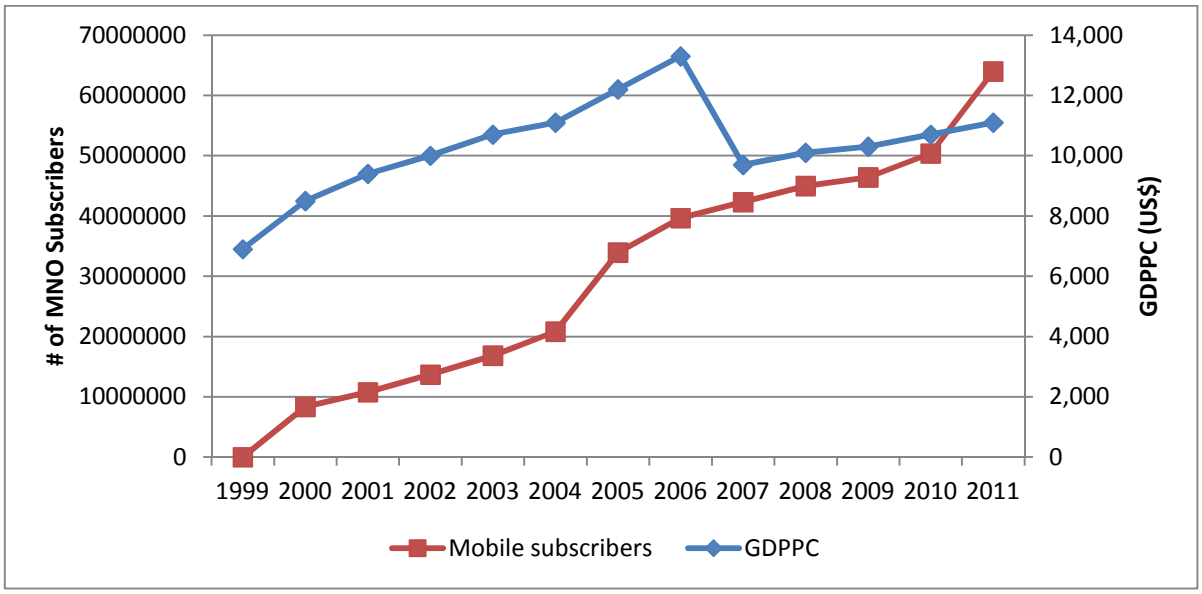
- **The combined effect ICT and financial institutions, resulting in two-sided markets, creates a cumulative positive impact across observed South Africa.**
  - Multiple variables, with independent variables consisting of previously defined indicators of individual welfare (As per proposition 1 & 2 above)

4.7 Research limitations

Due to the extent of the research study, only South Africa as part of Southern Africa was considered. The study also evaluates against FNB as they are considered the market leaders in mobile banking in South Africa. The timeframe that will be evaluated also only considers developments within the last seven years, which observes the period since the first introduction of mobile banking in South Africa.

The study will exclude social factors and will focus purely on the economic impacts of mobile technologies. The absence or presence of other methods of virtual and electronic banking will not be considered.


Scatterplot of GDPPC vs MNO Subscribers of MNO_GDPPC
GDPPC / MNO_GDPPC
MNO Subscribers / MNO_GDPPC
y = 3E-05x + 9677.8
R² = 0.1587
0
2000
4000
6000
8000
10000
12000
14000
0
10000000
20000000
30000000
40000000
50000000
60000000
70000000


# of MNO Subscribers
GDPPC (US$)
0
10000000
20000000
30000000
40000000
50000000
60000000
70000000
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Mobile subscribers
GDPPC

Data set:

Year	MNO Subscribers	GDPPC (US$)
2000	8339000	8500
2001	10787000	9400
2002	13702000	10000
2003	16860000	10700
2004	20839000	11100
2005	33959958	12200
2006	39662000	13300
2007	42300000	9700
2008	45000000	10100
2009	46436000	10300
2010	50372000	10700
2011	64000000	11100

Regression table:

Summary	Multiple R	R-Square	Adjusted R-Square	StErr of Estimate
	0.3984	0.1587	0.0746	1221.271772

ANOVA Table	Degrees of Freedom	Sum of Squares	Mean of Squares	F-Ratio	p-Value
Explained	1	2814119.255	2814119.255	1.8868	0.1996
Unexplained	10	14915047.41	1491504.741		

Regression Table	Coefficient	Standard Error	t-Value	p-Value	Confidence Interval 95% Lower	Upper
Constant	9677.785123	752.9565562	12.8530	< 0.0001	8000.093366	11355.47688
MNO Subscribers	2.79576E-05	2.03536E-05	1.3736	0.1996	-1.7393E-05	7.33083E-05

Correlation and Covariance:

Correlation Table	MNO Subscribers MNO_GDPPC	GDPPC MNO_GDPPC
		0.398
MNO Subscribers	1.000	Correlation is not significant
GDPPC	0.398	1.000

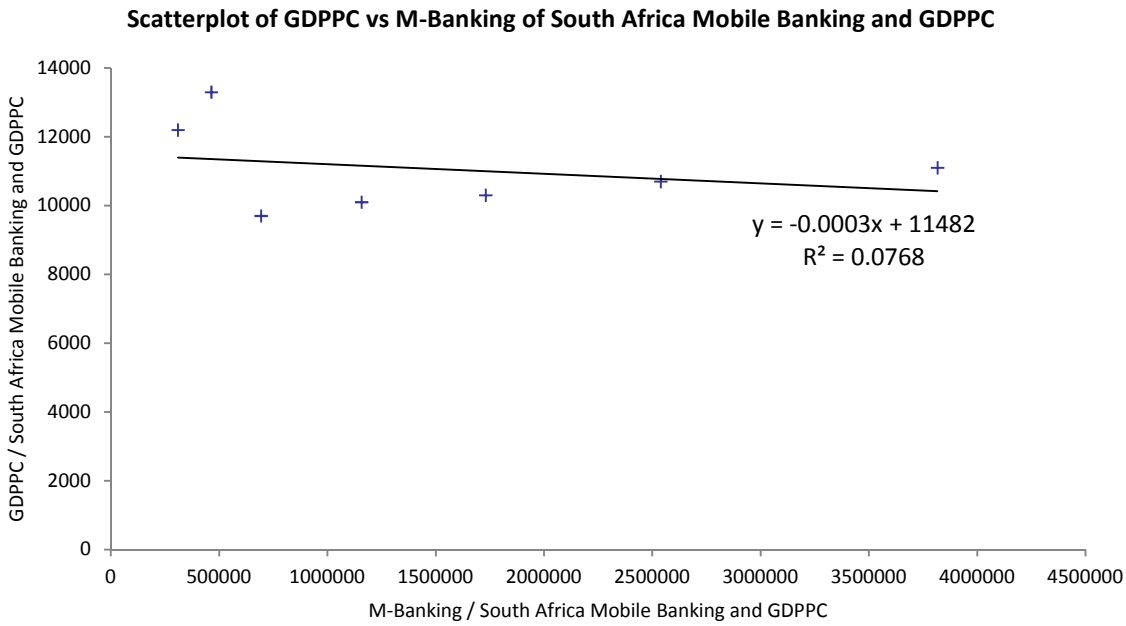
Covariance Table	MNO Subscribers MNO_GDPPC	GDPPC MNO_GDPPC
MNO Subscribers	327302120734299.00	9150594616.67
GDPPC	9150594616.67	1611742.42

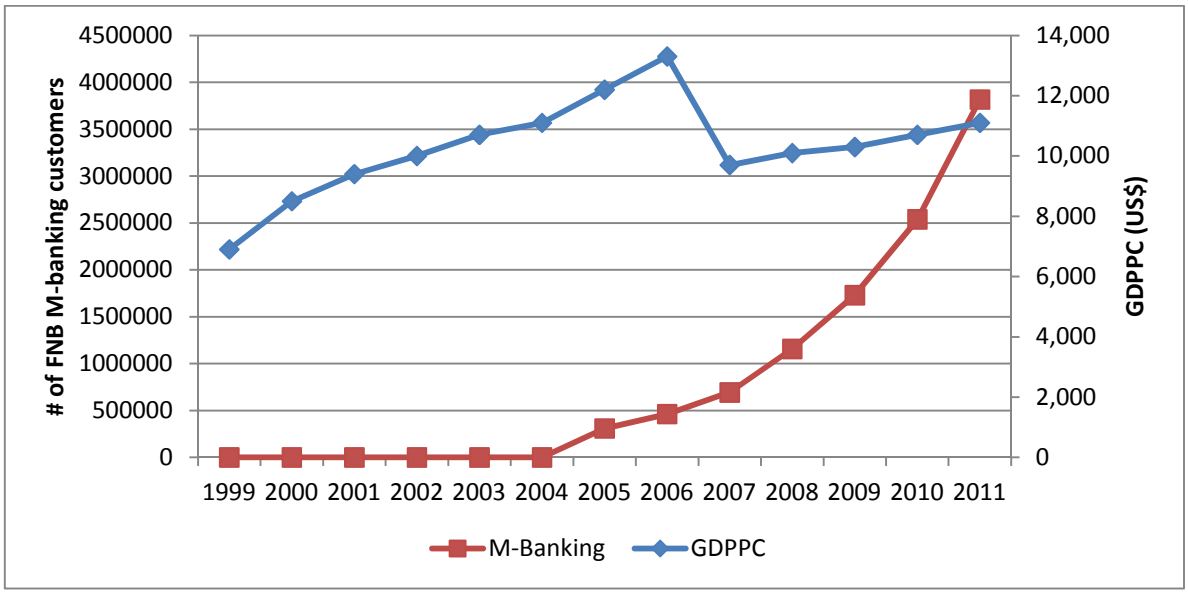
One Variable Summary:

One Variable Summary	**MNO Subscribers MNO_GDPPC**	**GDPPC MNO_GDPPC**
Mean	32688079.83	10591.67
Variance	327302120734299.00	1611742.42
Std. Dev.	18091493.05	1269.54
Skewness	0.0831	0.6605
Kurtosis	1.7947	3.9775
Median	33959958.00	10300.00
Mean Abs. Dev.	15485566.53	925.00
Mode	42320666.67	10700.00
Minimum	8339000.00	8500.00
Maximum	64000000.00	13300.00
Range	55661000.00	4800.00
Count	12	12
Sum	392256958.00	127100.00
1st Quartile	13702000.00	9700.00
3rd Quartile	45000000.00	11100.00
Interquartile Range	31298000.00	1400.00
1.00%	8339000.00	8500.00
2.50%	8339000.00	8500.00
5.00%	8339000.00	8500.00
10.00%	10787000.00	9400.00
20.00%	13702000.00	9700.00
80.00%	46436000.00	11100.00
90.00%	50372000.00	12200.00
95.00%	64000000.00	13300.00
97.50%	64000000.00	13300.00
99.00%	64000000.00	13300.00

Summary:

The R^2 value of .1587 indicates that the single independent variable, MNO Subscribers (x), is able to explain 15.87% of the variation in the GDPPC (y) variable. This supports the high level of correlation (0.398) that was previously determined.


Scatterplot of GDPPC vs M-Banking of South Africa Mobile Banking and GDPPC
GDPPC / South Africa Mobile Banking and GDPPC
M-Banking / South Africa Mobile Banking and GDPPC
y = -0.0003x + 11482
R² = 0.0768
0
2000
4000
6000
8000
10000
12000
14000
0
500000
1000000
1500000
2000000
2500000
3000000
3500000
4000000
4500000


# of FNB M-banking customers
GDPPC (US$)
0
500000
1000000
1500000
2000000
2500000
3000000
3500000
4000000
4500000
0
2,000
4,000
6,000
8,000
10,000
12,000
14,000
1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
M-Banking
GDPPC

Data set:

Year	FNB M-Banking Subscribers	GDPPC (US$)
2005	309,489	12,200
2006	463,252	13,300
2007	693,452	9,700
2008	1,157,398	10,100
2009	1,729,787	10,300
2010	2,538,098	10,700
2011	3,816,076	11,100

Regression table:

Summary	Multiple R	R-Square	Adjusted R-Square	StErr of Estimate		
	0.2772	0.0768	-0.1078	1344.949886		
ANOVA Table	**Degrees of Freedom**	**Sum of Squares**	**Mean of Squares**	**F-Ratio**	**p-Value**	
Explained	1	752691.8766	752691.8766	0.4161	0.5473	
Unexplained	5	9044450.981	1808890.196			
Regression Table	**Coefficient**	**Standard Error**	**t-Value**	**p-Value**	**Confidence Interval 95%** **Lower**	**Upper**
Constant	11482.18352	832.2133229	13.7972	< 0.0001	9342.911071	13621.45597
M-Banking	-0.000277868	0.00043076	-0.6451	0.5473	-0.001385173	0.000829437

Correlation and Covariance:

Correlation Table	M-Banking South Africa Mobile Banking and GDPPC	GDPPC South Africa Mobile Banking and GDPPC
M-Banking	1.000	-0.277 Correlation is not significant
GDPPC	-0.277	1.000
Covariance Table	**M-Banking South Africa Mobile Banking and GDPPC**	**GDPPC South Africa Mobile Banking and GDPPC**
M-Banking	1624760374663.57	-451468702.38
GDPPC	-451468702.38	1632857.14

One Variable Summary:

One Variable Summary	M-Banking South Africa Mobile Banking and GDPPC	GDPPC South Africa Mobile Banking and GDPPC
Mean	1529650.29	11057.14
Variance	1624760374663.57	1632857.14
Std. Dev.	1274660.89	1277.83
Skewness	1.0501	0.9974
Kurtosis	3.3246	3.1287
Median	1157398.00	10700.00
Mean Abs. Dev.	998574.33	979.59
Mode	397153.68	9790.00
Minimum	309489.00	9700.00
Maximum	3816076.00	13300.00
Range	3506587.00	3600.00
Count	7	7
Sum	10707552.00	77400.00
1st Quartile	463252.00	10100.00
3rd Quartile	2538098.00	12200.00
Interquartile Range	2074846.00	2100.00
1.00%	309489.00	9700.00
2.50%	309489.00	9700.00
5.00%	309489.00	9700.00
10.00%	309489.00	9700.00
20.00%	463252.00	10100.00
80.00%	2538098.00	12200.00
90.00%	3816076.00	13300.00
95.00%	3816076.00	13300.00
97.50%	3816076.00	13300.00
99.00%	3816076.00	13300.00

Summary:

The R^2 value of .0768 indicates that the single independent variable, m-Banking subscribers (x), is able to explain 7.68% of the variation in the GDPPC (y) variable. This supports the high level of correlation (-0.277) that was previously determined.

5.3 Proposition 3: The combined effect ICT and financial institutions, resulting in two-sided markets, creates a cumulative positive impact across Southern Africa.

Multiple variables, with independent variables consisting of previously defined indicators of individual welfare (As per proposition 1 & 2 above)

Data set:

	MNO Subscribers	FNB M-Banking Subscribers	GDPPC (US$)
2005	33,959,958	309,489	12,200
2006	39,662,000	463,252	13,300
2007	42,300,000	693,452	9,700
2008	45,000,000	1,157,398	10,100
2009	46,436,000	1,729,787	10,300
2010	50,372,000	2,538,098	10,700
2011	64,000,000	3,816,076	11,100

Regression table:

Summary	Multiple R	R-Square	Adjusted R-Square	StErr of Estimate	
	0.3402	0.1157	-0.3264	1471.674836	
ANOVA Table	**Degrees of Freedom**	**Sum of Squares**	**Mean of Squares**	**F-Ratio**	**p-Value**
Explained	2	1133835.569	566917.7846	0.2618	0.7819
Unexplained	4	8663307.288	2165826.822		

Regression Table	Coefficient	Standard Error	t-Value	p-Value	Confidence Interval 95% Lower	Upper
Constant	15272.46877	9081.007071	1.6818	0.1679	-9940.448858	40485.38641
MNO Subscribers	-0.00010864	0.000258974	-0.4195	0.6964	-0.000827666	0.000610386
M-Banking	0.00050855	0.001933	0.2631	0.8055	-0.004858319	0.005875419

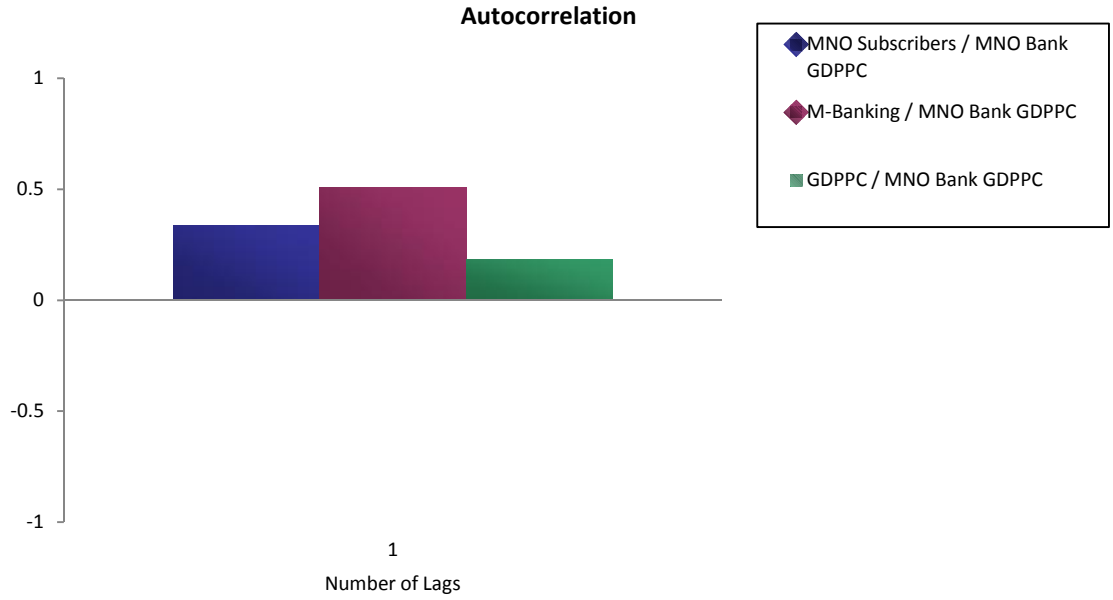
Correlation and Covariance:

Correlation Table	MNO Subscribers MNO Bank GDPPC	M-Banking MNO Bank GDPPC	GDPPC MNO Bank GDPPC
MNO Subscribers	1.000	0.970	-0.317
M-Banking	0.970	1.000	-0.277
GDPPC	-0.317	-0.277	1.000

Covariance Table	MNO Subscribers MNO Bank GDPPC	M-Banking MNO Bank GDPPC	GDPPC MNO Bank GDPPC
MNO Subscribers	90519486305966.30	11761277879319.50	-3852803238.10
M-Banking	11761277879319.50	1624760374663.57	-451468702.38
GDPPC	-3852803238.10	-451468702.38	1632857.14

One Variable Summary:

One Variable Summary	MNO Subscribers MNO Bank GDPPC	M-Banking MNO Bank GDPPC	GDPPC MNO Bank GDPPC
Mean	45961422.57	1529650.29	11057.14
Variance	90519486305966.30	1624760374663.57	1632857.14
Std. Dev.	9514172.92	1274660.89	1277.83
Skewness	1.0639	1.0501	0.9974
Kurtosis	4.9333	3.3246	3.1287
Median	45000000.00	1157398.00	10700.00
Mean Abs. Dev.	6549637.80	998574.33	979.59
Mode	34710959.05	397153.68	9790.00
Minimum	33959958.00	309489.00	9700.00
Maximum	64000000.00	3816076.00	13300.00
Range	30040042.00	3506587.00	3600.00
Count	7	7	7
Sum	321729958.00	10707552.00	77400.00
1st Quartile	39662000.00	463252.00	10100.00
3rd Quartile	50372000.00	2538098.00	12200.00
Interquartile Range	10710000.00	2074846.00	2100.00
1.00%	33959958.00	309489.00	9700.00
2.50%	33959958.00	309489.00	9700.00
5.00%	33959958.00	309489.00	9700.00
10.00%	33959958.00	309489.00	9700.00
20.00%	39662000.00	463252.00	10100.00
80.00%	50372000.00	2538098.00	12200.00
90.00%	64000000.00	3816076.00	13300.00
95.00%	64000000.00	3816076.00	13300.00
97.50%	64000000.00	3816076.00	13300.00
99.00%	64000000.00	3816076.00	13300.00



Autocorrelation Table	MNO Subscribers MNO Bank GDPPC	M-Banking MNO Bank GDPPC	GDPPC MNO Bank GDPPC
Number of Values	7	7	7
Standard Error	0.3780	0.3780	0.3780
Lag #1	0.3377	0.5065	0.1835

6. Discussion of research results

6.1 Introduction

As part of the introduction of the research paper, the objectives were highlighted in terms of how m-banking and ICT can influence the wealth of individuals in South Africa. In this chapter we will explore if the propositions have been valid or not and also discuss concerns relating to the propositions not being met.

At the outset of the research, there was meaningful evidence to suggest that in order to create an environment that is conducive for creating financial inclusion and therefore, in turn, to increase wealth among individuals, a two-pronged approached is required that would consist of both an increase in access to m-banking facilities as well as an expansion in the ICT infrastructure of a country.

The subsequent research aimed to establish what is required in the environment of m-banking that will bring about the changes or acceleration of existing services, which will promote financial inclusion and possible wealth creation, provided that there exists a meaningful correlation between them

As part of the literature review of the research paper central themes were investigated around the research problem. It aimed to build the foundation around the importance of exploring growth and take-up of m-banking.

The theory around the role that ICT plays in m-banking and development as well as the ultimate impact that it has on individuals and their wealth has also been explored.

6.2 Overview

A low correlation in all instances between the dependant variable and the independent variables has been observed. This implies that there is no significant relationship between the two measurements. The correlation coefficient lies very close to zero in all instances, which means that one cannot infer that one variable would be increasing or decreasing as a result of a change in the other.

In order to confidently justify propositions one, two and three a positive correlation would have to be observed, meaning that the correlation should be as close as possible to positive one (+1). This would have implied that and increase in MNO subscriptions or an increase in m-banking registered customers would have resulted in an increase in GDPPC, or personal wealth. There is no indication that there is significant evidence to suggest that individual wealth (measured as GDPPC) can be influenced by either the uptake of mobile subscriptions with MNOs or the implementation of m-banking in South Africa.

There is also a lack of evidence to suggest that two-sided markets result in an increase in wealth. In this instance, two-sided markets refer to the simultaneous exchange of information between the MNO and FNB, resulting in a beneficial series of events where demand for the one will trigger a demand for the other (Eisenmann *et al*. (2006). It was observed in terms of the joint evaluation of m-banking and mobile phone subscribers in relation to GDPPC.

6.3 Exploration of the findings: Proposition 1, 2 & 3

The broad nature of ICT and ICT4D

The dismissal of the propositions may be attributed to the fact that mobile technologies on their own do not encompass the entire field of ICT and as such cannot justify development of individuals on its own in terms of ICT4D.

Even though we have seen evidence from Bångens & Söderberg (2008), that record levels of growth and development was seen in the mobile technology industry, this would not seem to necessarily translate into direct benefit to individuals in terms of personal wealth.

They may however on a higher level, be the catalyst for the enablement of a country's economic and social development as we've explained earlier. The same can be said for m-banking in the context of ICT4D.

The translation of growth into individual wealth

Earlier in the paper, we have seen that previous suggestions have been made that an increase in the growth of mobile phone disbursements may create an environment that is favourable towards financial inclusion (Kpodar & Andrianaivo, 2011). This in turn, theoretically, should trigger positive spin-offs in individual wealth.

Dittus & Klein (2011) noted four key points, which in their opinion are required to enable financial inclusion and ultimately increase individual wealth. These comprise of exchanging different forms of money for another, creating a safe-storage facility for money, enabling person-to-person transfers as well as the investment of money.

Willingness to adopt technologies in the abundance of choice

The case that access to financial services will benefit the poor and also stimulate economic growth (Kpodar & Andrianaivo, 2011; Demirgüç-Kunt & Klapper, 2012), may be to broad of a statement to explain the benefit of m-banking and mobile technologies on individual wealth in South Africa.

The argument has also been observed that within the context of ICT4D, m-banking and mobile money is primarily concerned with reaching the unbanked and individuals at the BoP (Alampay & Bala, 2010). Bångens & Söderberg (2008) said that the unbanked are for the most part rural poor people trying to make a living in largely cash-based and informal economies.

Alampay & Bala (2010) maintained that the limited access to established physical financial channels such as bank branches and card-based infrastructure required the unbanked to use virtual technologies to facilitate their varying forms of cash flows, such as m-banking.

Keeping in mind the aforementioned, it was also observed that South Africa enjoys relatively high numbers of financial inclusion (FinMark Trust, 2011). James & Versteeg (2007) also argued that mobile technologies play an important role as a contributor to development in the absence of fixed-line infrastructure, which is not the case in South Africa.

This may beg the question whether or not other forms of ICT such as telephone and internet banking are still not perhaps perceived to be safer or more convenient than m-banking. South Africa enjoys an extensive fixed line infrastructure as well as wide spread bricks-and-mortar bank branch networks. This could imply that customers and consumers may not necessarily require the ability to bank remotely via a mobile phone, as seen in evidence from M-PESA in Kenya (Dittus & Klein, (2011). The success of M-PESA could be attributed to geographically wide spread access to banking facilities and a well developed mobile network infrastructure.

This would imply that even though South Africa enjoys very high mobile network operator subscriptions (CIA Factbook, 2010), they prefer to use their devices for other means such as social networking, web browsing, voice and data communication, rather than a vehicle for facilitate banking transactions. This conforms to the argument by Pickens *et al*. (2009) that there are differences in the growth paths of different geographic areas.

The impact of the global financial crisis on the study

Though South Africa remained relatively cushioned from the 2007 global financial crisis, it would make sense to infer that GDPPC across the world, including South Africa would have been negatively influenced during this period. Upon observing the time series of the GDPPC data that was collected and used for the study, a clear downward trend is noted during this period. This ultimately may have impacted the results of the study. A recommendation would be to remove this as an outlier, but it brings into question the meaningfulness of the analysis, given the short period that is already under observation as mobile banking has only been operational in South Africa for the last 7 years.

Meeting all of the criteria for financial inclusion and transformation

From the literature review it was observed that m-banking can be transformational provided that it meets four general criteria (Porteous, 2006). The following table examines the criteria against the result from the research:

Table 4: Meeting the criteria for transformational banking (Porteous, 2006)

Criteria	Yes	No	To some degree
The model utilises existing ICT infrastructure that is already within the reach of unbanked or underbanked people.	Established MNO infrastructure; Established banking channels.		
It is more often than not driven by MNOs rather than traditional financial institutions.		Not in the case of FNB; M-PESA may be an example but in Kenya, not South Africa.	
It leverages alternative distribution networks for the dissemination of cash, rather than just leveraging conventional banking infrastructure such			Banks have only recently started to engage in joint-ventures with retailers in South Africa to allow cash withdrawals and deposits at retail outlets.

as automated teller machines (ATM's) and point-of-sale (POS) devices.			
It may be more affordable that traditional banking.	FNB pricing reveals that electronic transactions via mobile phones are less costly than other means of transacting.		

The study only conforms to two out of the four criteria, which implies that a transformational banking model is absent.

7. Conclusion

7.1 Introduction

This chapter integrates the key findings of the research and concludes with recommendations for future research.

7.2 Key findings and business applications

The following have been identified as key findings resulting from this research paper:

1. The rapid growth of technologies does not necessarily imply individual financial prosperity;
2. The rapid growth of technologies does not necessarily imply that individuals are financially excluded;
3. Registration for a financial product, does not imply financial inclusion, increase in individual wealth or the lack thereof when other financial channels and products are readily accessible;
4. When observing ICT4D in the individual context, a holistic approach in relation to all aspects of ICT and development should be taken. M-Banking alone cannot prove or dispel the benefits;
5. Two-sided markets in mobile banking may create prosperity at an industry or macro-economic level, but these benefits are not necessarily passed on to the end user;
6. Countries with open border policies and free trade agreements and who share a common monetary currency system, can influence each others' reaction towards economic forces;
7. The growth seen in m-banking registrations should be viewed in parallel with the organisations other banking channels, to evaluate if the channel itself is successful in servicing customer needs or if people are not just more open to ICT technologies in general;

7.3 Future research

Future research need to consider themes around a deeper understand of ICT4D and the role that m-banking and mobile technology plays in this realm. It needs to incorporate the broader elements around development informatics in relation to development economics. There currently exist some evidence on both sides of the spectrum, but given the inter relationships between the human, technological and financial aspects in the m-banking space, deeper academic attention needs to be provided to the field.

Given the short lifecycle of m-banking in South Africa, the study may benefit from qualitative supplementation of the research, until such time when a period of at least 10 to 15 years can be observed quantitatively.

An aspect that may be incorporated into the research is the cross-border remittance trends and that affects the individual wealth of individuals, both from a sender and recipient perspective.

8. Appendices

8.1 Appendix one: Reference list

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8.2 Appendix two: Consistency matrix

Title: The economic impact of mobile banking on developing countries.

Propositions / Questions / Hypotheses	Literature review	Data collection tool	Analysis
1. The introduction of mobile technology results in an increase in individual wealth of a person in South Africa.	• Anderson (2010) • Anyasi & Otubu (2009) • Bångens & Söderberg (2008) • Grace, Kenny, and Qiang (2003) • Jensen (2007) • Kpodar & Andrianaivo (2011)	• Secondary data	• Linear Regression Analysis
2. The introduction of m-banking results in an increase in individual wealth of a person in South Africa.	• Anyasi & Otubu (2009) • Dittus & Klein (2011) • Kpodar & Andrianaivo (2011) • Pickens, Porteous, & Rotman (2009) • Vincent & Cull (2011)	• Secondary data	• Linear Regression Analysis
3. The combined effect ICT and financial institutions, resulting in two-sided markets, creates a cumulative positive impact across observed South Africa.	• Aker & Mbiti (2010) • Donner (2008) • Donner & Tellez (2008). • Eisenmann, Parker & Van Alstyne (2006) • Porteous (2006) • Rochet & Tirole (2006)	• Secondary data	• Multiple Regression Analysis

8.3 Appendix three: Project time line

	Milestone	Date
1.	Choose research topic	19/01/2012
2.	Undertake preliminary research review	19/01/2012
3.	Submit shortened research review	29/01/2012
4.	Submit concept paper with supervisor selection document	27/02/2012
5.	Define research questions and objectives	22/04/2012
6.	Submit research proposal	24/04/2012
7.	Main literature reading	24/05/2012
8.	Literature review written	15/06/2012
9.	Methods chosen and draft methods chapter written	01/07/2012
10.	Data collection completed	07/07/2012
11.	Data analysed, draft findings and conclusions to be written	07/08/2012
12.	Final draft submitted	07/10/2012
13.	Final submission	07/11/2012

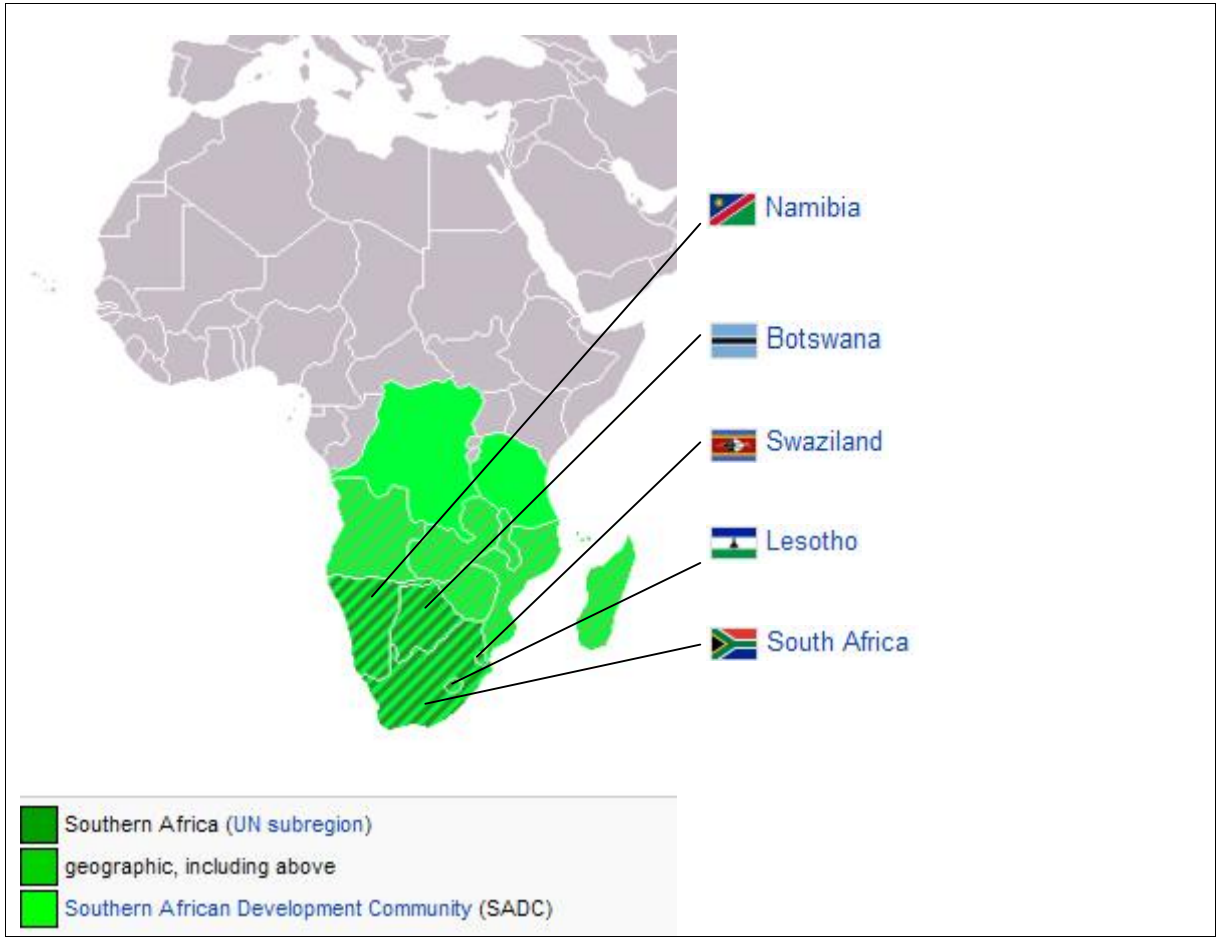
8.4 Appendix four: Supporting artefacts

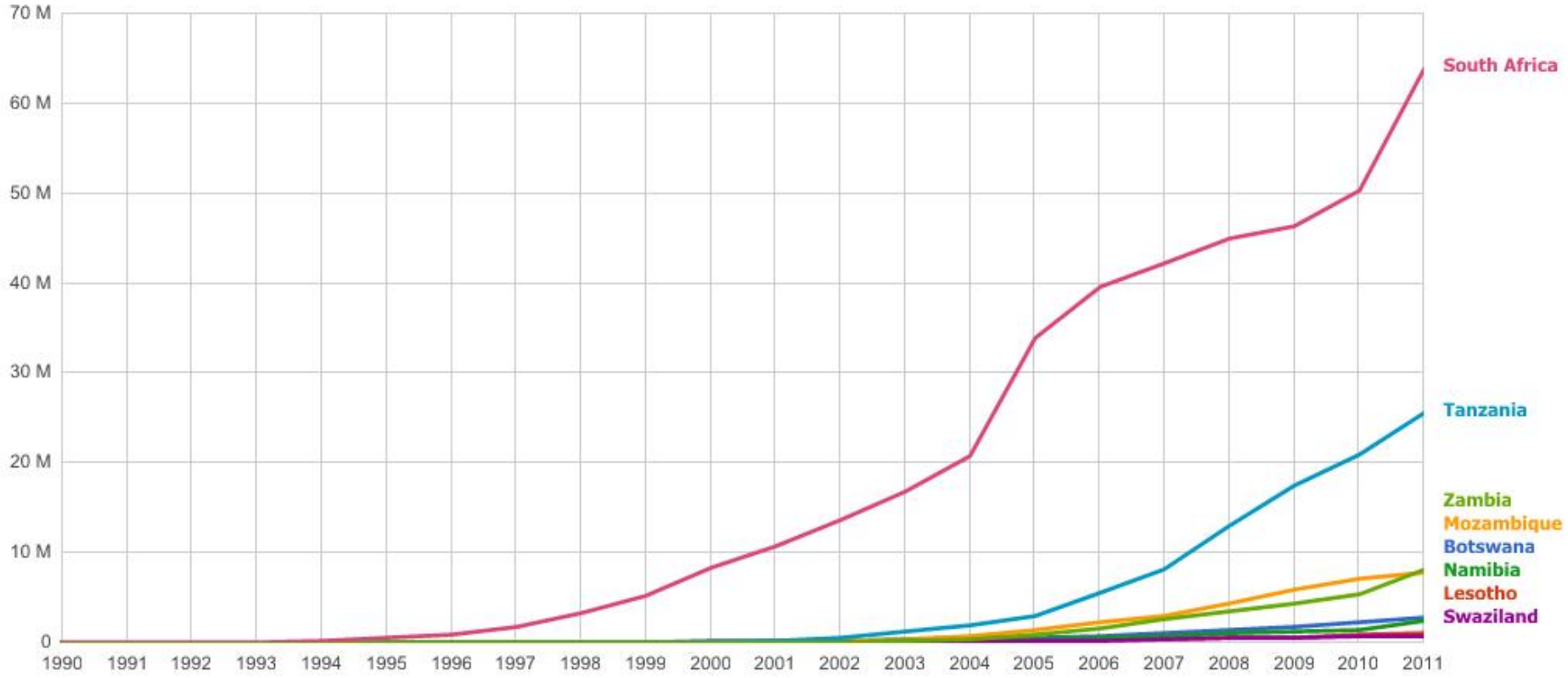
Artefact A:

Southern Africa as defined by the United Nations (UN) scheme of geographic regions and Southern African Customs Union (SACU).

Source: http://en.wikipedia.org/wiki/Southern_Africa

Accessed: 20 April 2012

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