



**Mobile Banking and the financial services needs of the poor:  
An adoption framework**

**Mbali Tshitenge**

**10646702**

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

**9 November 2011**

## **Abstract**

“Over the past ten years, ITCs have become an important element in sustaining economic growth and poverty reduction through increasing efficiencies, enabling the delivery of social services, or creating new sources of income and employment” (Fourati, 2009, p. 37) . m-banking is one such technological development that has a potential to increase economic participation by low-income consumers. This research examines the factors influencing the adoption of mobile banking by low-income consumers in South Africa, with a special focus on the banking needs of the poor. The research framework was adapted from Tan and Teo (2000) and assessed the impact of these nine variables on the intention to adopt m-banking: relative advantage, compatibility with values, compatibility with banking needs, compatibility with cell phone use experience, complexity, “trialability”, risk, self-efficacy and support. Data for this study was collected through a physical hardcopy survey in Soweto, in Gauteng.

The research found that low-income consumers will consider adopting m-banking as long as it offers them an improved way over the current mechanisms of managing their money, it is compatible with their financial services needs and they consider themselves as having the necessary skills to use it.

**Key words:** Bottom of the Pyramid (BOP), Financial inclusion, ITC4D, m-banking adoption, Attitude, Perception of behavioural control

## 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.

---

Mbali Tshitenge

09 Nov 2011

## Acknowledgements

I would like to extend my sincerest thanks and unending gratitude to following people that have made the completion of this research and my MBA possible:

- Firstly and most importantly, to the Lord Almighty. “Akekho onjengawe!”
- Fanfan, my husband, for being the “*husband with the mostest*”. Without your support and encouragement I would have never embarked on this journey in the first place. You are truly my **better** half. Gros Bisou.
- Dr Clive Corder, my supervisor, for his availability, invaluable input and guidance in the completion of this research. His sense of humour and ‘built-in editing function’ helped tremendously.
- My family and friends, who have had to deal with my unavailability for a good part of the last two years, guess whose back!?
- To BWL for affording me the opportunity and time to complete my MBA, especially Mark Cleeve-Edwards for his support and personification of leadership.

## Table of Contents

1. Chapter 1 - Definition of Problem and Purpose .....	1
1.1 Background to Research Problem.....	1
1.2 Purpose of Research .....	4
1.3 Problem Relevance .....	5
2. Chapter 2 - Literature Review.....	8
2.1 BOP Defined - South African Context.....	8
2.2 Financial Services Needs of the Poor.....	10
2.2.1 Financial Inclusion for the Poor.....	11
2.2.2 Information Technologies and Communication for Development (ITC4D) .....	15
2.2.3 Mobile Banking .....	15
2.2.4 m-banking in South Africa.....	17
2.3 M-banking Adoption.....	20
2.3.1 Innovation Characteristics.....	20
2.3.2 Framework for Adoption.....	21
2.4 Research Framework .....	22
2.4.1.1 Attitude.....	23
2.4.1.1.1 Relative Advantage .....	23
2.4.1.1.2 Compatibility with Values.....	23
2.4.1.1.3 Compatibility with Experience.....	24
2.4.1.1.4 Compatibility with Banking Needs .....	24
2.4.1.1.5 Complexity.....	25
2.4.1.1.6 Trialability .....	25
2.4.1.1.7 Risk .....	25
2.4.1.2 Perceived Behavioural Control .....	26

2.4.1.2.1	Self-efficacy .....	26
2.4.1.2.2	Support .....	27
2.5	Conclusion .....	27
3.	Chapter 3 - Research Propositions .....	29
4.	Chapter 4 - Research Methodology and Design .....	31
4.1	Introduction .....	31
4.2	Research Design .....	32
4.3	Population .....	33
4.4	Element of Analysis .....	33
4.5	Sampling Method .....	34
4.6	Questionnaire Design .....	36
4.7	Data Collection .....	37
4.8	Analysis Approach .....	37
4.9	Internal Reliability .....	39
4.10	Research Limitations .....	40
5.	Chapter 5 - Results .....	41
5.1	Introduction to Results .....	41
5.1.1	Normality of Data .....	41
5.2	Sample Size and Response Rate .....	43
5.3	Demographic Characteristics .....	43
5.3.1	Age .....	44
5.3.2	Gender .....	44
5.3.3	Income .....	44
5.4	Descriptive Statistics .....	44

5.4.1	Cell phone Use .....	44
5.4.2	Employment Status .....	45
5.4.3	Banking Status .....	46
5.4.4	Intention to Adopt m-banking .....	46
5.5	Inferential Descriptive Statistics .....	47
5.5.1	Analysis of Variance .....	47
5.5.2	Correlation of Variables .....	48
5.5.3	Propositions .....	49
5.5.3.1	Relative Advantage .....	49
5.5.3.2	Compatibility with Values .....	50
5.5.3.3	Complexity .....	51
5.5.3.4	“Trialability” .....	51
5.5.3.5	Cell Phone Experience .....	52
5.5.3.6	Banking Needs .....	53
5.5.3.7	Risk .....	53
5.5.3.8	Self-efficacy .....	54
5.5.4	Factor Analysis .....	55
5.6	Summary .....	57
6.	Chapter 6 - Discussion of Results .....	59
6.1	Introduction .....	59
6.2	Discussion of the Propositions .....	59
6.2.1	Relative Advantage .....	59
6.2.2	Compatibility with Values .....	61
6.2.3	Complexity .....	62

6.2.4	Trialability.....	63
6.2.5	Cell Phone Experience.....	64
6.2.6	Banking Needs.....	65
6.2.7	Risk.....	66
6.2.8	Self-Efficacy .....	67
6.2.9	Support .....	68
6.2.10	Summary .....	68
7.	Chapter 7 - Conclusion .....	70
7.1	Introduction.....	70
7.2	Findings and Implications .....	70
7.2.1	Relative Advantage.....	70
7.2.2	Banking Needs.....	71
7.2.3	Cell Phone Experience and Self-Confidence and Trialability .....	72
7.2.4	Government Support.....	74
7.3	Suggestions for Future Research .....	75
7.4	Conclusion.....	75
8.	Works Cited .....	77
9.	Appendix 1 - Questionnaire .....	83
10.	Appendix 2 - Data Distribution .....	87
11.	Appendix 3 - Demographic Analysis Results .....	88
12.	Appendix 4 - Factor Loadings.....	89

## Table of Figures

Figure 1 - Three Mobile banking scenarios .....	4
Figure 2 - Majority of the world's financially unserved adults by location .....	5
Figure 3 - Data Services Usage Patterns.....	6
Figure 4 - South African Economic Pyramid .....	9
Figure 5 - Research Framework.....	28
Figure 6 - Map of Soweto.....	31
Figure 7 - Employment Status.....	45
Figure 8 - Banking Status.....	46
Figure 9 - Data Distribution .....	87
Figure 10 - Age Distribution.....	88
Figure 11 - Income Distribution .....	88

## List of Tables

1 - South African Social Grants .....	10
2 - Independent and Dependent variables.....	32
3 - Reliability Analysis.....	39
4 - Shapiro-Wilk W Test.....	42
5 - Skewness and Kurtosis .....	42
6 - Cell phone usage .....	45
7- m-banking intention to adopt .....	46
8 - Banking Status and Intention to adopt m-banking .....	47
9 - 1 Way ANOVA by Intention to Adopt.....	48



10 - Statistical Significance of Correlations .....	49
11 - Factor Score Correlation .....	57
12 - Summary of Analysis Results.....	57
13 - Gender Representation .....	88
14 - Factor Loadings.....	89

## **1. Chapter 1 - Definition of Problem and Purpose**

### **1.1 Background to Research Problem**

Prahalad (2005) defined the Bottom of the Pyramid (BOP) as the approximately 4 billion of the world's poorest who survive on less than \$2 a day, providing an economic opportunity, internationally, of almost \$13 trillion a year. The majority of this population is found in Sub-Saharan Africa (SSA). The SSA region is characterised by some of the lowest levels of infrastructure development in the world: only 29 percent of the roads are paved, a quarter of the population has access to electricity and there are less than 3 landlines available per 100 people (Aker & Mbiti, 2010). However, as of 2008, close to 60 percent of the population in the region had access to mobile phones compared to less than 40 percent in 1999 (Etzo & Collender, 2010). Aker and Mbiti (2010, p. 9) examined the growth of mobile phone technology over the past decade and its impact on the quality of life in SSA and identified the following five potential mechanisms through which mobile phones had the potential to provide economic benefits to consumers and producers in SSA:

- Access to and use of information thereby increasing market efficiency;
- Improvement of a firm's productive efficiency allowing it to better manage its supply chains;
- Creation of new jobs to address demand for mobile related services;

- Facilitate communication among social networks in response to shocks such as natural disasters or political uprising, thereby reducing households exposure to risk; and
- “m-development” - which refers to mobile phone-based applications that have the potential to facilitate the delivery of financial, educational, health and agricultural services.

This research focused on the m-development mechanism with regards to mobile phone-based applications, in particular m-banking, and its ability to deliver financial services to those that did not previously have access.

Belief in the potential for mobile phones to help meet the financial services needs of the poor has been driven by the rapid expansion of mobile phone networks into regions that were previously un-served and communities in developing countries (Duncombe & Boateng, 2009).

Etzo and Collender (2010, p. 662) described the types of benefits of what they termed “The Mobile Phone Revolution in Africa” as follows:

- **Incremental** - where mobile phones improved the speed and efficiency of what people are already doing.
- **Transformational** – where mobile phones offered a completely new service or product, which in the absence of mobile phones would have been inaccessible.
- **Production related**– where mobile phone diffusion had resulted in the selling of mobiles and related services.

Porteous (2006, p. 3) defined mobile banking as “financial transactions undertaken using mobile devices such as a cell phone”. He added that m-banking also involved access by mobile devices to a broader range of banking services such as account based savings or transactions offered traditionally by banks. Porteous (2007, p. 6) introduced the concept of “Transformational m-banking” as the provision of banking services using a mobile phone (m-banking or cell phone banking) in such a way that currently un-banked people were targeted.

In their paper reviewing past research in mobile phones and financial services in developing countries Duncombe and Boateng (2009) identified the following levels of analysis with respect to past m-finance research:

- Studies assessing needs or requirements;
- Studies concerned with design of systems and areas of application;
- Studies concerned with processes of adoption and adaptation; and
- Studies concerned with assessing impact

Duncombe and Boateng (2009) came to the conclusion that whilst application design and adoption studies had received a great amount of detail by researchers, issues assessing financial need and measurement of impact had been comparatively neglected. They stated that there was a lack of focus on assessing financial needs and aspects of financial service behaviours and preferences of poor users in advance of specifying m-finance solutions.

## 1.2 Purpose of Research

The purpose of this research was to identify the factors that influence m-banking adoption, specifically the importance of the financial services needs of the poor. The inference to be made is whether m-banking in the form of currently available m-banking solutions have had a transformational effect in providing access to financial services for those that did not previously have access.

Mas and Kumar (2008) referred to three mobile banking scenarios as outlined below:

**Figure 1 - Three Mobile banking scenarios**

	Cool value add	Easy bank	Virtual bank
<b>Strategic objectives for the provider</b>	Retain and grow value from existing customers	Increase market share (take customers from the competition)	Increase penetration (target new-to-banking or underserved people)
<b>Role of mobile channel</b>	Mobile is a complementary channel, with most customers using it only for specific purposes	Mobile and other channels co-exist, but are targeted (perhaps not exclusively) to different segments	Mobile is likely the only channel for most (if not all) customers
<b>Value proposition for customers for use of the mobile channel</b>	Service enhancements: <ul style="list-style-type: none"> <li>• Enhanced customer control over own finances (e.g., alerts and notifications)</li> <li>• Greater targeting of messages and services from the bank (e.g., using location awareness)</li> <li>• 24/7 availability of service</li> </ul>	Convenience: <ul style="list-style-type: none"> <li>• Less but more relevant services</li> <li>• Ubiquity of service</li> <li>• Simple, easy to use</li> <li>• Low cost</li> </ul>	Reduced barriers to access: <ul style="list-style-type: none"> <li>• Very low transactional costs</li> <li>• Availability of service in areas not traditionally covered by banks</li> <li>• Use of retail outlets rather than branches (where they may not feel welcome)</li> </ul>

Source: Mas & Kumar (2008, p. 10)

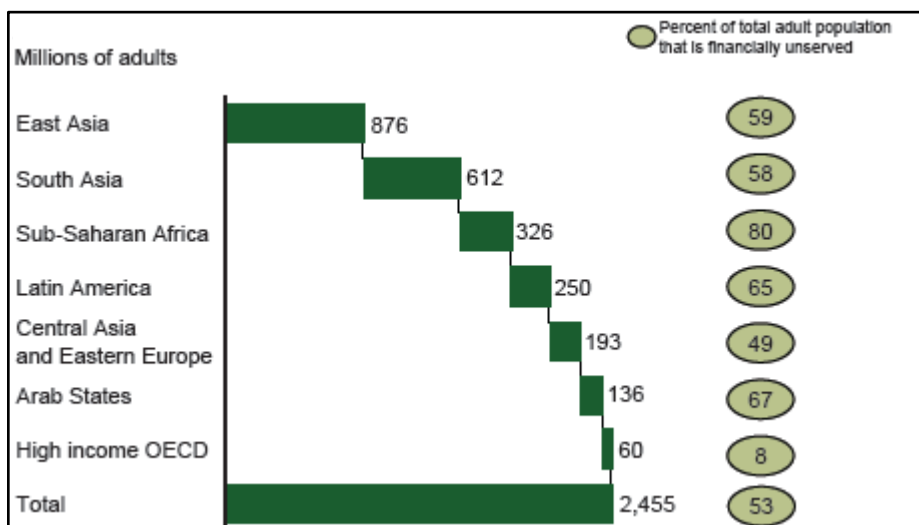
The m-banking offering in the Virtual Bank scenario is described as “likely to be less than perfect, but customers are more tolerant because they do not have many

alternatives” (Mas & Kumar, 2008, p. 10). This research focused on m-banking as described in the Virtual Banking scenario and whether m-banking adoption was reflective of the financial service behaviours and preferences of the poor.

### 1.3 Problem Relevance

Research conducted by the Financial Access Initiative found that 2.5 billion of the world adult population did not use formal financial services to save or borrow (Chala, Dalal, Goland, Gonzalez, Morduch, & Schiff, 2009). This research found that eighty percent of the adult population in Sub-Saharan Africa was financially unserved as outlined in Figure 2 below.

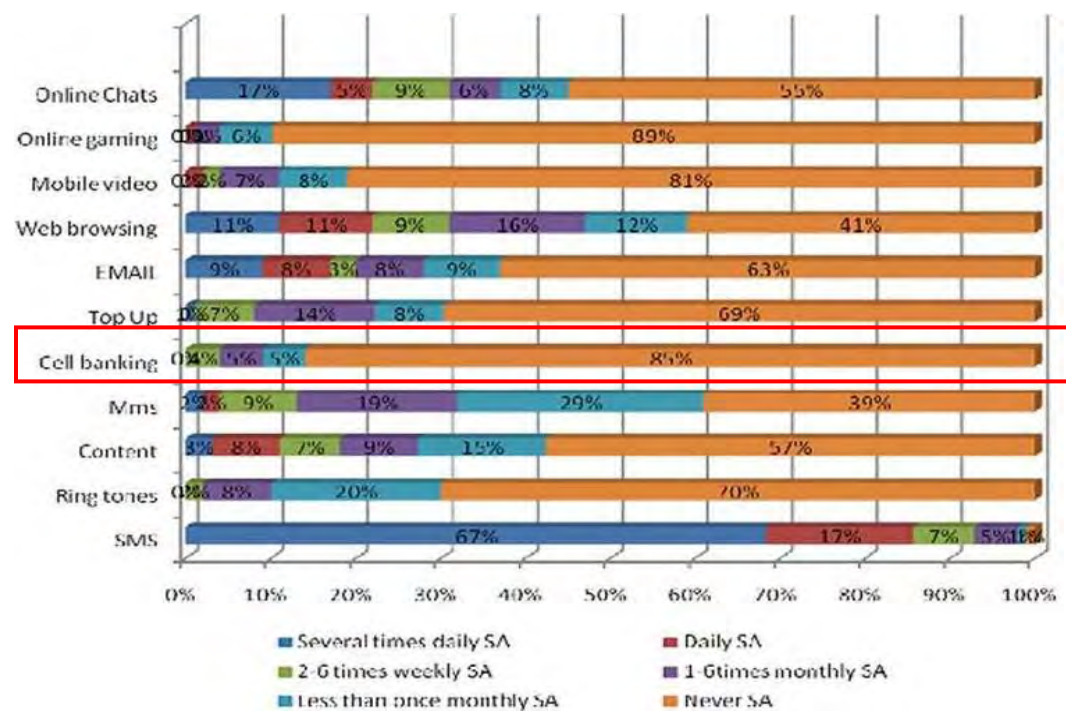
**Figure 2 - Majority of the world’s financially unserved adults by location**



Source: World Bank 2008 Human Development Index cited in Chala, Dalal, Goland, Gonzalez, Morduch, & Schiff (2009)

The high incidence of the unbanked is a manifestation of the exclusion of poor people from traditional banking models (Chala et al., 2009). m-banking has the potential to address the financial services needs of low-income consumers however, m-banking adoption has been very low. Ramburn and Van Belle (2011) found that of all data services, cell-phone banking was the second least used after online gaming, with 85 percent of respondents indicating that they never used it all, see Figure 3.

**Figure 3 - Data Services Usage Patterns**



Source: Ramburn and Van Belle (2011)

The financial services needs and preferences of the poor are described by Rutherford (1999, p. v) as the provision of a mechanism to save money, turn the savings into bigger lumps which can then be applied to a variety of uses in a safe, convenient, flexible and affordable way. m-banking is one such mechanism that could enable low-income consumers access to financial services and reduce the number of financially unserved people in South Africa. It is therefore important to understand the variables that influence m-banking adoption by low-income consumers in order to facilitate the transformational effect of m-banking.

## **2. Chapter 2 - Literature Review**

Mobile banking (m-banking) has helped meet the financial services needs of the poor and has been driven by the rapid expansion of mobile networks into areas where infrastructure development has been slow (Duncombe & Boateng, 2009). The terms m-banking and m-finance will be used interchangeably in this research and can be assumed to refer to the same concept – access to financial services using mobile devices.

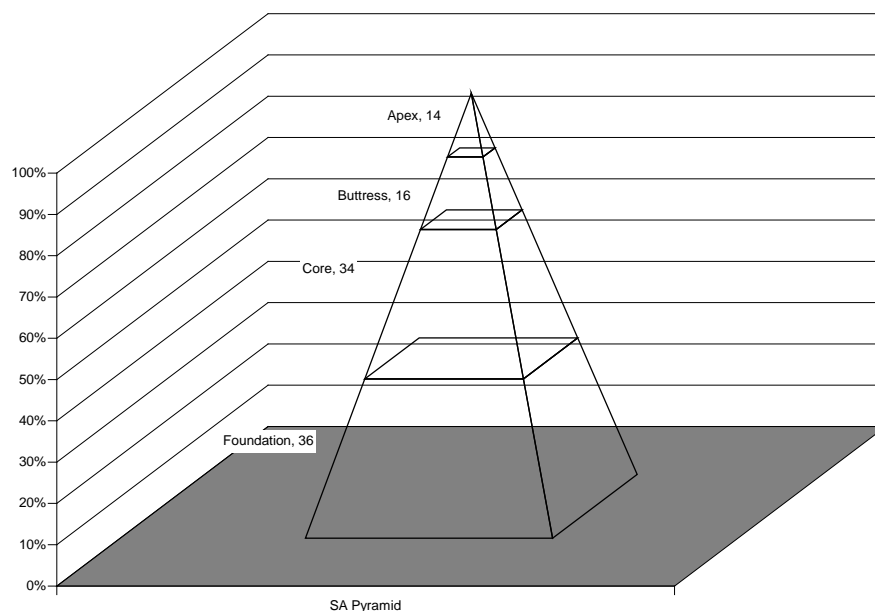
m-banking can be seen as an enabler through which those at the BOP can have access to and pay for products and services – a phenomenon often referred to as ‘banking the unbanked’. The consensus is that expansion of banking services can have a positive impact on the users of those services as well as contribute to economic growth and poverty reduction (Aker & Mbiti, 2010). Aker and Mbiti (2010) however raised questions about the nature and extent of m-banking’s impact on the welfare of BOP users in developing countries.

### **2.1 BOP Defined - South African Context**

Chipp and Corder (2009) proposed a definition of the BOP in the South African context that was focused on the collective rather than the individual definition of income and other variables. They proposed a South African pyramid made up of four tiers defined by empirically derived definition for all social strata based on the Living Standards Measure (LSM) which is based on the well being of an individual’s household (Haupt, 2006). The four tiers were defined as follows: The

Foundation tier being defined as LSMs 1-4, Core being LSMs 5-6, Buttress being LSMs 7-8 and the Apex of the pyramid being LSMs 9-10 (See Figure 4).

**Figure 4 - South African Economic Pyramid**



Source: Chipp & Corder (2009)

Based on research conducted by Chipp and Corder (2009), the South African BOP market could be defined as individuals earning a mean monthly income of \$8.33 per day and a household's earnings of \$13.14 a day. Taking inflation into account, this will be individuals earning approximately R1, 450 per month or households earning R2, 250 a month. The South African foundation tier income is higher than the \$2 per day described by Prahalad (2005) largely due to the social grants provided by the South African government. The government grants as at April 2011 are shown in Table 1:

**Table 1 - South African Social Grants**

Grant Type	Amount payable as from 1 April 2010	Amount payable as from 1 April 2011
Old Persons Grant (Old age pension)	R1 080.00	R1 140.00
Old Persons Grant (Old age pension): Beneficiary older than 75 years	R1 100.00	R1 160.00
Disability grant	R1 080.00	R1 140.00
War veterans' grant	R1 100.00	R1 160.00
Grant-in-aid	R250.00	R260.00
Child support grant	R250.00	R260.00
Foster child grant	R710.00	R740.00
Care-dependency grant	R1 080.00	R1 140.00
Institution (25%)	R270.00	R285.00

Source: South African Social Security Agency (2011)

## 2.2 Financial Services Needs of the Poor

A large number of households in Sub Saharan Africa (SSA) lack access to financial services which results in the impediment of economic growth and development (Kimenyi & Ndung'u, 2009). The understanding of the financial services needs of the poor has evolved in the past couple of years (Martin, Hulme, & Rutherford, 1999). Martin et al. (1999) argued that a new image of the poor was emerging which was one of a diverse group of vulnerable households with complex livelihoods requiring a full set of micro financial services. They argued that “such financial services help the poor maintain and improve their livelihoods, not merely by giving them access to credit to start or run a business, but also by offering them savings and insurance services that help them maintain and improve their human and social capital throughout their lives” Martin et al. (1999, p. 3).

The poor are looking for safe, accessible, flexible savings opportunities that provide them with positive returns and enable them to build a buffer of cash (Tejerina, Bouillon, & Demaestri, 2006). Tejerina et al.(2006) put forward that the poor need to be able to save when they have the opportunity to do so, to withdraw when they need their savings, and to do this without depleting their savings over time.

Concerning m-banking adoption, Bångens and Söderberg (2008) found that the unbanked were willing to adopt new technology when it met a “real” need that translates into a demand for a specific service such remittance or topping up airtime.

### **2.2.1 Financial Inclusion for the Poor**

Birkenmaier and Tyuse Watson (2005) suggested that the financial services and sources of credit available to poor families affected the rate at which families could be financially empowered through building assets. The World Development Bank referred to the term Financial Inclusion (FI) as a way of enabling poor people to access financial services and within the broader context of inclusive development result in reduction of poverty and inequality (Chibba, 2009).

In his research into banking for the poor, Hinson (2011) highlighted geographical distance, bureaucratic bank services and inability of the poor to post required collateral for loans, being confused with their inability to meet their financial

obligations. These were the impediments preventing poor people from accessing traditional banking services. Hinson (2011) further posited that social intermediation was an important element to reduce the gap created by poverty, illiteracy and remoteness. He defined social intermediation as “a process in which investments are made in the development of human resources and institutional capital, with the aim of increasing self-reliance of marginalised groups, preparing them to engage in formal financial intermediation” (Hinson, 2011, p. 324).

Birkenmaier and Tyuse Watson (2005) suggested that under representation of banks in low-income communities, high minimum balance requirements and high fees relative to financial resources available also contribute to poor people staying away from the traditional banking channels. Porteous (2005) using FinScope 2004 data identified three basic reasons for individuals to remain unbanked – income reasons, access related and by choice. At the time of his research he found that, 9 percent of respondents were unbanked by choice, 13 percent due to lack of access to financial services and the remaining 78 percent due to insufficient income to save or have a bank account.

Lastly, Batchelor as cited in Duncombe & Boateng (2009) identified the greatest need amongst the poor as being for cash in-cash out systems, and person-to-person transactions that can be additive by substituting for existing informal practices. Duncombe and Boateng’s (2009) study also identified a need among the

poor to facilitate remittances of small value that could become uneconomic when transaction costs are high.

Chibba (2009, p. 220) identified five explanatory financial inclusion models through which creating access to the unbanked could be achieved:

- **financial sector consensus** – where, given a favourable governmental, institutional and political climate, the financial sector took strategic action to address financial inclusion through a consensus-driven process;
- **public sector leadership** – where the public sector prepared the strategy/action plan and then called on stakeholders to participate and/or formed direct partnerships with stakeholders;
- **private sector development** – where the private sector, inclusive of financial and non-financial firms, individually, jointly or through partnerships, designed and implemented market-based approaches;
- **civil society/non-profit sector** – where Non-Government Organisations (NGOs), voluntary organisations, charities, non-profit organisations including research and policy institutes, acted individually, jointly or through partnerships, to tackle financial inclusion; and
- **catalytic model** – where financial inclusion was supported through various catalytic channels such as advocacy, research, facilitation, funding, advisory services and partnerships.

In the case of South Africa, Chibba (2009) found that the financial sector consensus model for financial inclusion was in use. The Mzansi account, which is an entry-level bank account, based on a magnetic stripe debit card platform, was developed by the South African banking industry. It was launched collaboratively by the four largest commercial banks together with the state-owned Post-bank in October 2004 (Centre for Microfinance, 2009). This initiative, through the Financial Services Charter, was largely responsible for the increase in the number of South Africans with bank accounts. This was indicative of the financial sector consensus approach, which occurs given a favourable governmental, institutional and political climate and allows the financial sector to take action to address financial exclusion through a consensus driven process (Chibba, 2009). Increasingly, the private sector development model is also being applied as evidenced by the success of Capitec Bank in South Africa. Capitec Bank has accumulated over 1.3 million clients and has been growing at the rate of 50,000 new clients per month, making a serious dent in the unbanked statistic (Tata Consultancy Services , 2009). Capitec Bank focuses on the low to middle income market segment. Through its innovative banking platform, it has eliminated the need for back offices in their branches resulting in decreased paperwork and administration fees enabling it to significantly reduce the cost of banking for its clients (Capitec Bank, 2011).

## **2.2.2 Information Technologies and Communication for Development (ITC4D)**

“Over the past ten years, ITCs have become an important element in sustaining economic growth and poverty reduction through increasing efficiencies, enabling the delivery of social services, or creating new sources of income and employment” (Fourati, 2009, p. 37). As advanced by Chibba (2009), financial inclusion is an important part of poverty reduction. There is a link in developing economies between technology, specifically cell phone diffusion, and economic development (Aker & Mbiti, 2010, Donner & Tellez 2008, Duncombe & Boateng 2009 and Fourati, 2009). In Sub-Saharan Africa there are more mobile phone users than people with bank accounts (Aker & Mbiti, 2010). It is in this context that mobile phone technology, in as far as it provides access to services, can play an important role in financial inclusion. Mobile phones have increasingly become part of the everyday lives of the poor, and it has been argued that they have the potential to become a low cost accessible ‘account’ or delivery channel for financial information, services and transactions (Porteus, 2006).

### **2.2.3 Mobile Banking**

Mobile phones have increasingly become a part of the everyday lives of the poor. Porteous (2007) argued that they had the potential to become a low cost accessible ‘account’ or delivery channel for financial information, services and transaction. Such services include long-distance remittances, micro payments, and

informal airtime bartering schemes, and are referred to by different terms some of which are mobile banking, mobile transfers, and mobile payments (Donner & Tellez, 2008). Donner and Tellez (2008, p. 319) further classified three functions of what they termed m-finance:

- store value in a remote account accessible by handset;
- convert cash in and out of stored value account by visiting a bank branch or retail agent; and
- transfer stored value between individual account holders by means of text message or menu driven commands and Personal Identification Numbers (PIN).

Whilst m-banking may present an additional channel for existing banking customers, m-banking for the unbanked has brought about transformational change by extending the reach of financial services that they would otherwise not have access to (Porteous, 2007). m-banking is transformational because it uses existing infrastructure to reach the unbanked, it creates new distribution networks for financial transactions, and depending on the competitiveness of the offer, may be cheaper than traditional banking (Porteus, 2006). m-banking also presents a delicate balance between a conceptually powerful opportunity which entails being able to transact anytime from anywhere and practical challenges such as finicky menu sequences on a small screen and tiny buttons (Mas & Kumar, 2008, p. 1).

m-banking can enable financial institutions to overcome the difficulty in providing profitable services through traditional channels to poor clients (Ivatury & Pickens, 2006). Ivatury and Pickens (2006) suggested that financial institutions see m-banking as a form of 'branchless banking' which lowers the costs of serving low-income customers.

There are still a high number of poor people that are excluded from financial services. This exclusion is mostly based on income as a qualifier to access traditional transactional banking (Porteous, 2007). From the perspective of financial institutions, infrastructure development and non-profitability of this customer segment has resulted in it being largely ignored (Mas & Kumar, 2008). Mas and Kumar (2008) proposed that mobile phones had the potential to bridge the gap between financial institutions and the poor who may not have lump sums to invest, but have small sums of money to save over a period of time.

#### **2.2.4 m-banking in South Africa**

There are a number of m-banking models that have evolved over the years. The most prominently used currently are the following (Infogile Technologies, 2007, p. 2):

- Bank focused model - a traditional bank uses non-traditional low cost delivery channels to provide banking services to its existing customers.

- Bank led model - offers a distinct alternative to conventional branch-based banking in that customer conducts financial transactions at a whole range of retail agents (or through mobile phone) instead of at bank branches or through bank employees.
- Non-bank model - The non-bank-led model is where a bank does not come into the picture, except as a safe-keeper of surplus funds, and the non-bank organisation performs all the functions.

In their assessment of mobile banking for the unbanked, Rangan and Lee (2011) advanced the Third-party led and Multinational Organisation (MNO) led models for mobile banking. Both these models are similar to Infogile Technologies' (2007) Non-bank model for mobile banking as the initiatives were not driven by banks.

In South Africa, all of the large retail banks offer additional access channel via mobile phones for existing bank account holders, which is managed on traditional bank systems through cell phone banking. In 2004 and 2005, respectively, WIZZIT and MTN Banking (a joint venture of the mobile operator MTN and Standard Bank) each developed a mobile phone-based transaction banking product with the specific intent of providing financial services to low-income customers (Consultative Group to Assist the Poor, 2010). In South Africa, deposit taking institutions are required to have a banking license, which are currently restricted to existing banks. Obtaining a banking license is an onerous and costly process therefore m-banking solution vendors have to involve established banks to fulfil

legislative requirements for accepting customer deposits (Consultative Group to Assist the Poor, 2010). This acts as a barrier to innovation in the m-banking solutions space, especially as traditional banks have been slow to adopt m-banking as a customer solution.

The m-banking landscape in South Africa is represented by the following operators (Ivatury & Pickens, 2006):

<b>Product</b>	<b>Model</b>	<b>Description</b>
<b>WIZZIT</b>	Non-bank model	Product is low cost transactional bank account that uses cell phones for making person-to-person payment, transfers and prepaid purchases. Deposits are guaranteed by Bank of Athens.
<b>MTN Mobile Money</b>	Non-bank model	MTN Mobile Money is an electronic wallet service that enables users to make person-to-person payments - in real time - between Mobile Money account holders. Deposits are guaranteed by Standard Bank.
<b>Vodacom M-Pesa</b>	Non-bank model	Vodacom M-pesa allows users to convert real money into electronic money at any authorised M-pesa Outlet. Users can then transfer this e-money to others, pay for goods and services as well as settle accounts. Deposits are guaranteed by Nedbank Bank.

## 2.3 M-banking Adoption

### 2.3.1 Innovation Characteristics

Innovation has been described as “an idea, material, or artefact perceived to be new by the relevant unit of adoption” (Rogers, 1983 in Akturan & Tezcan, 2010, p. 5). Garcia and Calantone (2002) further added that innovation exists to the extent that the potential adopter finds it new or unlike any other product. In this context, m-banking can be viewed as a new innovation aimed at low-income customers unlike existing banking products for this segment. Akturan and Tezcan (2010) theorised that the perception of innovation characteristics had an important influence on acceptance behaviour. Therefore, it would be reasonable to expect the perception of m-banking to have an impact on its adoption.

Rogers (1995, pp. 15-16) defined five major innovation characteristics:

- Relative advantage - “the degree to which an innovation is perceived as better than the idea it supersedes. The greater the perceived relative advantage, the more rapid its rate of adoption will be”.
- Compatibility – “the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopter. The adoption of an incompatible innovation requires the prior adoption of a new value system which is a relatively slow process”. The degree of relative advantage is often expressed as economic profitability,

social prestige, savings in time and effort, immediacy of the reward or as decrease of discomfort (Rogers, 1995, p. 212)

- Complexity – “the degree to which an innovation is perceived as difficult to understand and use. The innovations that are simpler to understand are adopted more rapidly than the innovations that require the adopter to develop new skills and understandings.
- Trialability – “the degree to which an innovation may be experimented with on a limited basis. An innovation that is “trialable” represents less uncertainty to the adopter”.
- Observability - “is the degree to which the results of an innovation are visible to others. The innovations that are relatively less observable diffuse more slowly”.

### 2.3.2 Framework for Adoption

Tan and Teo (2000) developed a framework based on the theory of planned behaviour (Ajzen, 1991) and the diffusion of innovations theory (Rogers, 1995). Their framework proposed that the attitudinal beliefs, social and perceived behavioural control had an influence on a person’s intention to adopt Internet banking. These concepts were defined as follows (Tan & Teo, 2000, pp. 7-8):

- **Attitude** - relating to a person’s perception towards an innovation, the premise being that attitudes predict intentions, and intentions predict behaviour.

- **Subjective norms** - as relating to social influences that may affect a person's intention to use Internet banking.
- **Perceived behavioural control** - relating to the individuals perception of whether they have the necessary resources and opportunities to adopt Internet banking.

Tan and Teo's (2000) study found that influence of the internet user's consumer relevant groups was not significant, reason being that, easy access to information about the Internet had made potential adopters less reliant on the information provided by their referent groups. A similar study done in South Africa by Hoppe, Newman, and Mugeru (2001) also rejected the hypothesis that subjective norms affected adoption of internet banking. Based on these findings, the concept of subjective norms was not included in the resulting research framework discussed in 2.4 below.

## **2.4 Research Framework**

Tan and Teo's (2000) framework was advanced as a way of assisting banks in understanding the key factors that influence the adoption of Internet banking service as well as providing information on the needs and preferences of the potential customers. Hoppe, et al. (2001) used Tan and Teo's (2000) framework to test the adoption of internet banking among South African internet users. The variables used in the framework are outlined below.

## **2.4.1.1 Attitude**

### **2.4.1.1.1 Relative Advantage**

Agarwal and Prasad (1998) theorised that the relative advantage of an innovation was positively related to its adoption. Tornatzky and Klein (1982) in Tan and Teo (2000, p. 9) found that relative advantage was an important factor in determining adoption of innovations. Ivatury and Pickens (2006) suggested that with m-banking low-income people no longer needed to use scarce time and financial resources to travel to distant bank branches. This could be viewed as the relative advantage provided by m-banking over traditional banking channels for low-income consumers.

### **2.4.1.1.2 Compatibility with Values**

Compatibility with values refers to the fact that an innovation is more likely to be adopted if it is compatible with the individual's value system (Agarwal & Prasad, 1998). In their study, Barki and Parente (2010) found that consumer behaviour of the Base of the Pyramid market in Brazil differed from that of their better off compatriots in that they had a different configuration of the perception of value. Therefore, in order for m-banking to be adopted by low-income consumers, solutions would need to be tailored to their financial management values.

#### **2.4.1.1.3 Compatibility with Experience**

Chung and Kwon (2009) defined mobile experience as a general experience with mobile services such as short messaging service (SMS), mobile broadcasting, mobile gaming, mobile learning, and mobile shopping, and not as an experience with one particular mobile service. Chung and Kwon (2009, p. 540) added that experience was assumed to increase users' confidence in their ability to master and use computers to support their task performance. This was supported by Hoppe et al.'s (2001) suggestion that the greater the experience using the internet, the more likely that internet banking would be adopted. It can be said then that the greater the experience using a cell-phone, the more likely that m-banking would be adopted based on

#### **2.4.1.1.4 Compatibility with Banking Needs**

Martin, Hulme, and Rutherford (1999) defined the poor as a diverse group of vulnerable households with complex livelihoods requiring a full set of micro financial services. Rutherford (1999, p. vi) added that good financial services for the poor would be those that suited their capacity to save and their needs for lump sums through product delivery that was convenient for the poor. Low-income consumers have a different set of banking application and services needs, and the compatibility of m-banking with those needs is expected to be a factor in m-banking adoption. Hoppe et al.(2001) theorised that the greater the use of banking products and services, the more likely that internet banking would be adopted.

#### **2.4.1.1.5 Complexity**

Complexity was defined as the degree to which an innovation was considered relatively difficult to understand and use and was found to negatively influence the adoption of m-banking (Cheung, Chang, & Lai, 2000). Akturan and Tezcan (2010) on the other hand found that complexity did not influence adoption of innovation. Although it would be ideal for m-banking applications to be as simple as possible, Mattilla (2003) argued that adoption of complex products depended on adopter's ability to develop new knowledge and new patterns of experience.

#### **2.4.1.1.6 Trialability**

Rogers (Rogers, 1995) suggested that potential adopters who had an opportunity to experiment with an innovation would feel more comfortable with it and would therefore be more likely to adopt it. Tan and Teo's (2000) study supported this argument. However, Akturan and Tezcan's (2010) study found that trialability did not influence adoption of innovation. Therefore, opportunity to experiment with m-banking cannot be considered a sole predictor of adoption, but together with other variables may have an impact on adoption.

#### **2.4.1.1.7 Risk**

Tan and Teo (2000) found that perceived security and privacy risk could be a major impediment to the adoption of internet banking. Security risk was related to the fear of financial loss, whereas privacy risk was connected to the ethical treatment of

the customer's personal information (Sinkkonen, Laukkanen, Kivijärvi, & Laukkanen, 2008). Shen, Huang, Chu, and Hsu (2010) added three risk factors: trust, behavioural introspection, and technology anxiety that were thought to influence the security concern in adopting the mobile banking service. Shen et al. (2010, p. 500) also found that trust was important in reducing consumers' risk perception when adopting a new technology. Risk is critical in all financial services channels but considering the newness of m-banking combined with the scarce financial resources of low-income consumers it becomes an important factor in the m-banking adoption decision.

#### **2.4.1.2 Perceived Behavioural Control**

##### **2.4.1.2.1 Self-efficacy**

Hoppe et al. (2001) referred to self-efficacy as the individual's self-confidence in their ability to perform a specific task. Bandura, 1986 cited in Luo, Li, Zhang, & Shim (2010) defined self-efficacy as a person's perception of how easy or difficult it would be to carry out behaviour. The individual's self-confidence in using m-banking is therefore key to the adoption of m-banking, the more confidence the individual has in their ability to use m-banking, the higher the likelihood of adoption.

#### **2.4.1.2.2 Support**

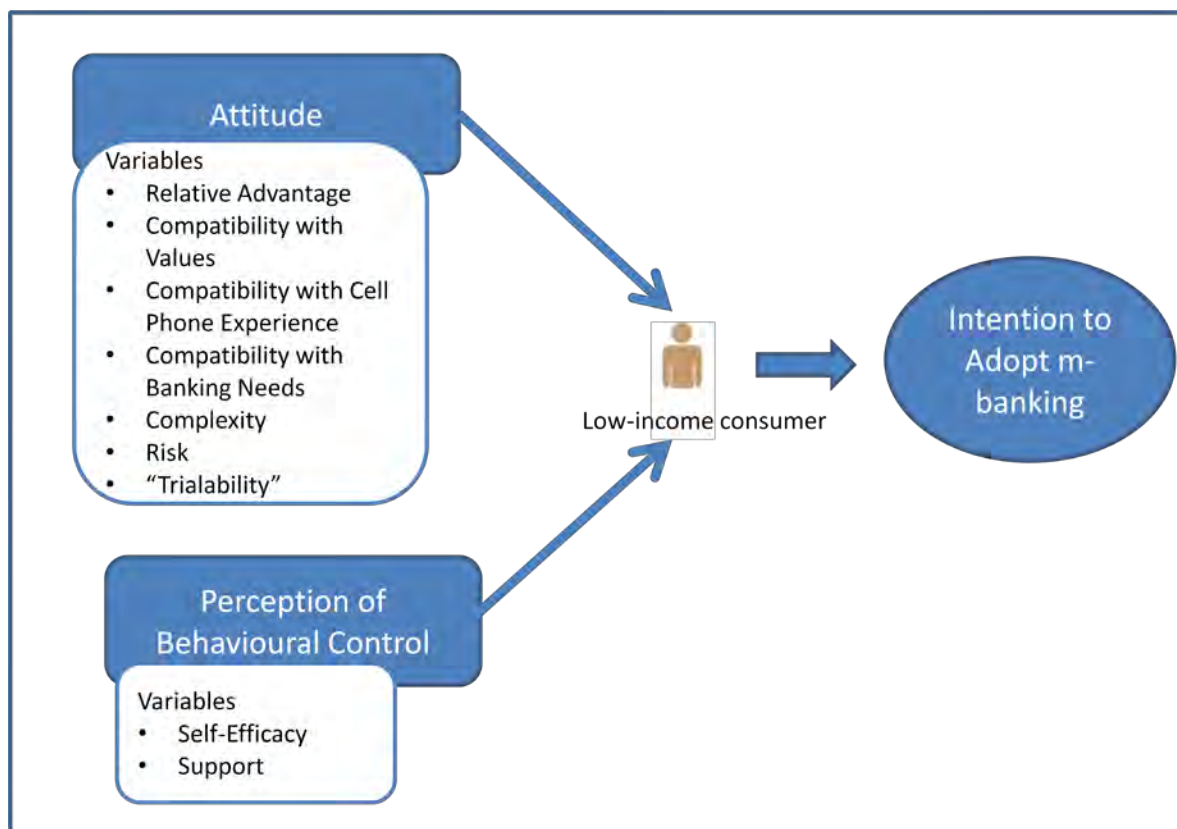
Goh (1995) identified two types of support: technological and government support. He suggested that government could play an intervention and leadership role in the diffusion of innovation. Chung and Kwon (2009) theorised that technological support referred to easy access to technological resources and infrastructure. On the contrary, Tan and Teo (2000) found support to have had no significant influence on users' intention to adopt internet banking. This was supported by Hoppe et al.(2001), who also found that support did not significantly affect the likelihood of internet banking adoption.

#### **2.5 Conclusion**

Hoppe et al. (2001) used Tan and Teo's (2000) framework to test the adoption of internet banking among South African internet users. Brown, Cajee, Davies, and Stroebel (2003) also used Tan and Teo's framework to assess adoption of cell-phone banking in South Africa. Brown et al.(2003) put forward that cell phone banking be considered as an extension of internet banking with the only difference being that rather than a web browser, a cell phone was being used. Brown et al.(2003) viewed cell phone banking as a new channel for existing bank account holders to access their accounts instead of going into the branch or using internet banking.

This research viewed m-banking as a new channel for those that were currently unbanked to access financial services. The framework, consisting of the variables discussed in 2.4.1.1 and 2.4.1.2 was applied (see Figure 5) to address the research problem.

**Figure 5 - Research Framework**



**Source:** Rogers (1995), Agarwal & Prasad(1998), Matin et al.(1999),Tan & Teo (2000), Hoppe et al.(2001), Brown et al.(2003), Chung & Kwon (2009)

### 3. Chapter 3 - Research Propositions

The research propositions are based on two main themes – the financial services needs and preferences of the poor and mobile banking. Duncombe and Boateng (2009) stated that m-finance research needed to be based on a more detailed understanding of the financial services behaviours and preferences of low-income customers. The research aims to determine the extent to which m-banking can increase access to financial services for three types of consumers, unbanked, previously banked and currently banked, based on their needs, perceptions and attitudes.

The following propositions were put forward:

- **Proposition 1** - The extent to which m-banking is viewed as offering an advantage over the current way of managing money, the more likely that m-banking will be adopted.
- **Proposition 2** – The greater the extent to which m-banking is viewed as being consistent with an individual's values, the more likely that m-banking will be adopted.
- **Proposition 3** – The greater the degree to which m-banking is considered difficult to understand and use, the less likely that m-banking will be adopted
- **Proposition 4** - The greater the extent to which users have an opportunity to experiment with m-banking before committing to using it, the more likely that m-banking will be adopted.

- **Proposition 5** - The greater the extent to which the consumer has previous experience using mobile phone technology and applications, the more likely that m-banking will be adopted.
- **Proposition 6** - The greater the extent to which m-banking meets the individual's needs for banking products and services, the more likely that m-banking will be adopted.
- **Proposition 7**- The greater the perceived sense of risk concerning conducting financial transactions by cell phone, the less likely that m-banking will be adopted.
- **Proposition 8** - The greater the individual's self confidence in his/her ability to use m-banking, the more likely that m-banking will be adopted.
- **Proposition 9** – The greater the extent to which support from mobile operators and government is available, the more likely that m-banking will be adopted.

The above propositions were focused on the relationship of the individual's attitude and perceived behavioural control with their intention to adopt m-banking.

## 4. Chapter 4 - Research Methodology and Design

### 4.1 Introduction

A quantitative survey was designed and implemented in Orlando East and West sections of Soweto, a grouping of townships to the South West of Johannesburg (See Figure 5). The focus was on a township rather than an informal settlement as it was possible to draw a representative sample since houses are more formally demarcated in the township. The choice of area was also driven by the fact that a township will have a slightly higher level of sophisticated cell phone users than the typical informal settlement.

**Figure 6 - Map of Soweto**



Source: South African History Online (2011)

## 4.2 Research Design

“A descriptive study aims to answer to the questions of what, when, where and sometimes how” (Blumberg, Cooper, & Schindler, 2008, p. 10). A descriptive design was used to identify how financial services needs of low-income consumers affect the extent to which m-banking can increase financial inclusion through access to financial services.

The primary data collected was used to test the relationships between the consumer’s attitude and perceived behavioural control (see Table).

**Table 2 - Independent and Dependent variables**

Independent variables	Dependent variable
<b>Attitude</b>	
Relative Advantage (RA)	Intention to adopt m-banking
Compatibility with Values (CV)	
Complexity (CX)	
Trialability (TR)	
Cell Phone Experience (CE)	
Banking Needs (BN)	
Risk (RS)	
<b>Perceived Behavioural Control</b>	
Self-efficacy (SE)	Intention to adopt m-banking
Support (SP)	

Data was obtained through a structured questionnaire, which was designed to assess the respondent’s demographic information, their use of mobile phones and attitudes towards mobile banking and the potential to address their financial services needs.

Blumberg et al.(2008) stated that it is normally hypothesised that in some way the independent variable causes the dependent variable to occur. A five point Likert scale was used to measure and rate responses. Likert scales assist in comparing one respondent's score with a distribution of scores from the defined sample and can be viewed as interval data (Blumberg et al, 2008).

### **4.3 Population**

The target population was low-income mobile phone users aged 21 years and above that live in Orlando East and West Townships which are part of Soweto in Johannesburg. It was further defined as individuals in households that fall in the Foundation tier according to the South African economic pyramid consisting of four levels as described in paragraph 2.1 above. The population excluded all other individuals that did not meet the above criteria.

### **4.4 Element of Analysis**

The unit of analysis is the “who” that is being studied and the group about which generalisations may be drawn post the research. The unit of analysis describes the level at which the research will be performed (Blumberg, Cooper, & Schindler, 2008). For the purposes of this research, the unit of analysis was the low-income consumer, male or female, who owned or made use of a mobile phone and were over 21 years of age in the Foundation tier.

## 4.5 Sampling Method

A sample is used to draw inferences about the population and as such the sample should represent the characteristics of that population (Blumberg et al, 2008). Low-income consumers are spread out in many areas within South Africa and to obtain a perfectly representative sample would have been impractical in terms of cost and time. For this reason, two townships of Soweto were chosen they were representative of most townships in South Africa.

The sample was drawn from 2 sections highlighted in red on Figure 6 within Soweto. A probability systematic sampling method was used which theoretically entails the sampling of every  $n$ th element in the population after a random start (Blumberg et al, 2008).

Five areas were identified using a map of the township and a random starting point, was selected in each area. The streets where the data collectors started were as follows: Lembede and Ngidi Streets in Orlando West and the Senaoane, Mofokeng and Sofasonke streets in Orlando East. The fifth home from the random start was selected to start the sampling and thereafter every fifth home was selected. In the event, that the fifth home did not meet the criteria defined for the population, the next house was selected. Overall, the aim was to sample 120 respondents, 25 from each identified area. A Kish Grid was applied for selecting one person to interview from among households with multiple residents meeting

the criteria. The technique involved documenting a list of eligible individuals at a particular address, ordered by age, and then selecting according to the serial number of the questionnaire. Where more than one adult above the age of 21 was found, the data collector was required to list all adults in order of age. The data collector was then required to match the appropriate number of qualifying adults in the house in the required age bracket to the last digit of the questionnaire code and select the number as given by the grid. The corresponding name to that number was then selected for interview

The method was applied as follows:

<b>KISHGRID</b>	<b>LAST FIGURE OF THE QUESTIONNAIRE CODE</b>										
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>0</b>
<b>Number of adults (Male or female) in household aged between 21-50years</b>	<b>1</b>	1	1	1	1	1	1	1	1	1	1
	<b>2</b>	1	1	2	2	1	1	2	2	1	1
	<b>3</b>	3	2	1	3	2	1	3	2	1	3
	<b>4</b>	2	3	4	1	2	3	4	1	2	3
	<b>5</b>	5	4	3	2	1	5	4	3	2	1
	<b>6</b>	1	2	3	4	5	6	1	2	3	4
	<b>7</b>	7	6	5	4	3	2	1	7	6	5
	<b>8</b>	1	2	3	4	5	6	7	8	1	2
	<b>+</b>										

In most households where the above situation was found, one of the members of the households volunteered to be interviewed and therefore the Kish grid was not applied. This then resulted in an area stratified, judgemental sample.

A final sample of 126 respondents was obtained (see 5.2).

## 4.6 Questionnaire Design

The questionnaire was designed to test the research propositions given in Chapter 3, see Appendix 1 - Questionnaire. Each of the questionnaires was allocated a unique code, combining the data collector's initials and questionnaire number. The survey questionnaire consisted of three sections.

Section one asked the respondents questions relating to their current cell phone use and ownership.

The second section, collected information regarding the respondent's demographic and economic profile such as Age, Gender, Employment status, Income and frequency thereof and lastly their current banking status. The respondents were also requested to indicate if they were using or familiar with any of the known m-banking applications.

The last section of the questionnaire requested respondents to indicate their perception of statements based on the variables in the research framework using a 5-point Likert scale from 1 ("strongly disagree") to 5 ("strongly agree"). This section also contained a question to measure the intent to adopt mobile banking, question 44. Where the respondent selected services that they intended to use, the responses were coded as "Yes" regarding the intention to adopt. Where the response "None" was selected – the intention to adopt was coded as "No" and

where the first option was selected, the intention to adopt was coded as “Uncertain”.

#### **4.7 Data Collection**

Data collectors were used to conduct face-to-face completion of the questionnaires. The data capturers were given an explanation of the study and its purpose and were taken through the questionnaire to ensure that they understood the questions and that there was a consistency of application. The data capturers were selected from Soweto and were familiar with the areas they were going to. A prerequisite was that they were conversant in English and local languages so as to address any questions that the respondents could potentially have.

#### **4.8 Analysis Approach**

All the questionnaire responses were captured in Microsoft Excel and coded to assist with data analysis. Descriptive statistics were performed on the demographic data. Pivot tables, pie charts and bar graphs were used to group the data and perform initial analysis of respondents.

The Kruskal-Wallis H test is a non-parametric Analysis of Variance (ANOVA) used to compare three or more independent groups of sampled data. It tests the null hypothesis that the different samples in the comparison were drawn from the same distribution or from distributions with the same median (StatSoft, Inc., 2011).

The test was used to identify possible symmetrical differences between groups, in this instance those that indicated they would adopt m-banking, those that were uncertain and those that would not adopt m-banking by comparing the means of the three groups to test for statistical significance at the 0.05 level. The test computes an H statistic and due to the assumption that H has a chi-square distribution, the number of samples in each group must not be too small. A typical rule is that each sample must have at least 5 measurements. The sampled data meets the criteria as discussed in paragraph 4.5.

The Spearman correlation coefficient was used to establish the correlation between the 9 variables. There was missing data in some of the responses, and Case Wise deletion of missing data was applied in those instances.

Factor analysis is a data reduction and analysis technique that strives to explain correlations among multiple outcomes as the result of one or more underlying explanations (StatSoft, Inc., 2011). Factor analysis was applied to the data. Factor analysis detects the structure in the relationships between variables by classifying the variables that accounted less and less for variance (Thurstone, 1931 in StatSoft, Inc., 2011). Factor Analysis produces factor loadings, which were then used to calculate factor scores. Further correlation and regression tests were performed on the factor scores to identify relationships between identified factors.

#### 4.9 Internal Reliability

The assessment of scale reliability is based on the correlations between the individual items or measurements that make up the scale, relative to the variances of the items (StatSoft, Inc., 2011). Cronbach's alpha is used to test whether a group of questions provide a reliable measure of an underlying variable. The value of alpha ranges from 0 to 1 and the questions are a reliable measure if the values of alpha are greater than 0.6. All except the Support scale had Cronbach's alphas of over .60 (See

Table 3). Removal of items from the Support scale did not improve the alpha.

**Table 3 - Reliability Analysis**

	Variables	Mean	Std.Dev.	Cronbach's alpha	No of items
Attitude	RELATIVE ADVANTAGE (RA)	3.22	1.11	0.98	6
	COMPATABLE WITH VALUES (CV)	3.33	1.01	0.93	2
	COMPLEXITY (CX)	2.71	1.00	0.93	3
	TRIALABILITY (TR)	3.68	1.18	0.97	2
	CELLPHONE EXPERIENCE (CE)	3.83	0.69	0.72	5
	BANKING NEEDS (BN)	3.60	0.81	0.87	4
	RISK (RS)	3.26	0.75	0.65	4
Perceived Behavioural Control	SELF-EFFICACY (SE)	3.15	0.97	0.91	6
	SUPPORT(SP)	3.96	0.92	0.24	3

The Support variable was not tested in subsequent analysis.

#### **4.10 Research Limitations**

A limitation of this research was that it was conducted in a limited and urban area being two townships in Soweto due to resource constraints. This presented the possibility of sampling error as the rural population, of which low-income consumers are a part of were not sampled.

Although the data collectors were trained on administering the questionnaire, the questionnaire itself was not piloted to evaluate the ability of the instrument to effectively test the constructs. This may have helped improve the reliability of the Support variable.

The “intention to adopt” construct was measured. In an ideal scenario, those who had already adopted m-banking should have been surveyed rather than having their “intention to adopt” measured as there is always a risk of deliberate falsification due people wanting to appear knowledgeable or belong. However, it would be a challenge to obtain a list of adopters from the banks, as this information is confidential.

## 5. Chapter 5 - Results

### 5.1 Introduction to Results

This Chapter presents the results of the analyses described in Chapter 4. A demographic analysis was performed to assess the characteristics and dimensions of the population surveyed. The analyses also served to test the scale of the variables used, reliability thereof, and provide an aggregated view of all the survey responses. The Complexity (CX) and Support (SP) variables contained negatively skewed statements and their results were reverse scored so as to be analysed together with the other variables. The Support variable was however removed based on the results of the reliability analysis as discussed in paragraph 4.9 above.

#### 5.1.1 Normality of Data

“Normality is critical in many statistical methods as violation results in interpretation and inference not being reliable or valid” (Park, 2008, p. 2). Basic knowledge of the underlying distribution of a variable, allows us to make predictions about how, in repeated samples of equal size, this particular statistic will "behave," that is, how it is distributed (StatSoft, Inc., 2011). The Shapiro-Wilk W test is the preferred test of normality because of its good power properties as compared to a wide range of alternative tests (Shapiro, Wilk, & Chen, 1968 in StatSoft, Inc., 2011). The Shapiro Wilk W test was used to test for the normality of questionnaire data and the results are presented in **Table 4**.

**Table 4 - Shapiro-Wilk W Test**

Shapiro-Wilk W Test of Normality (CI = 5%)		
Variable	W Statistic	p =
RELATIVE ADVANTAGE (RA)	0.92947	0.00001
COMPATABLE WITH VALUES (CV)	0.92786	0.00000
COMPLEXITY (CX)	0.94333	0.00005
TRIALABILITY (TR)	0.85627	0.00000
CELLPHONE EXPERIENCE (CE)	0.96662	0.00332
BANKING NEEDS (BN)	0.90091	0.00000
RISK (RS)	0.97094	0.00814
SELF-EFFICACY (SE)	0.93848	0.00002

The null hypothesis of the Shapiro-Wilk W test is that a sample is taken from a normal distribution. When p is less than 0.05 ( $p < 0.05$ ) for W, the null hypothesis is rejected. For all the variables above,  $p < 0.05$  for W therefore the data collected from our survey was not normally distributed. Skewness and kurtosis show how the distribution of a variable deviates from a normal distribution. The non-normality of the data distribution is further confirmed by the skewness and kurtosis values for the data see **Table 5** below.

**Table 5 - Skewness and Kurtosis**

	Valid N	Mean	Std.Dev.	Skewness	Kurtosis
RELATIVE ADVANTAGE (RA)	124	3.21	1.11	-0.12	-1.06
COMPATABLE WITH VALUES (CV)	124	3.32	1.01	-0.34	-0.64
COMPLEXITY (CX)	124	2.72	1.00	0.20	-0.68
TRIALABILITY (TR)	124	3.69	1.19	-0.78	-0.41
CELLPHONE EXPERIENCE (CE)	124	3.83	0.69	-0.28	-0.77
BANKING NEEDS (BN)	124	3.60	0.81	-0.92	0.84
RISK (RS)	124	3.27	0.76	0.13	0.34
SELF EFFICACY (SE)	124	3.19	1.05	-0.40	-0.24
SUPPORT(SP)	124	3.97	0.92	-0.86	0.38

If kurtosis of a random variable is less than three, the distribution has thicker tails and a lower peak compared to a normal distribution (Park, 2008), The kurtosis of all 9 variables was less than three therefore the data did not follow a normal distribution. See Appendix 2 - Data Distribution Figure 9 for data distribution.

This has implications on the type of tests that can be performed on the data. Non-parametric statistics, which are applied when populations are not normal, were therefore applied.

## **5.2 Sample Size and Response Rate**

In total, 126 were questionnaires validly completed and returned and these were used for analysis and testing of the propositions. The minimum required sample, at a 95% interval, with a 10% level of precision is 100 (Israel, 2009) therefore the 126 is within this required sample size.

## **5.3 Demographic Characteristics**

The demographic characteristics that were analysed for the sample were age, gender and income (see Appendix 3 - Demographic Analysis Results).

### **5.3.1 Age**

The largest number of respondents was between the ages of 25 and 34, making up 34% of the total or 43 of the 126 respondents (see Appendix 3 - Figure 10 - Age Distribution).

### **5.3.2 Gender**

The sample was dominated by males with 69 (55%) of the 126 respondents being male (see Appendix 3 - Demographic Analysis Results- Figure 11 - Income Distribution).

### **5.3.3 Income**

The respondents were required to indicate their personal average monthly income level, as well as frequency thereof. The majority of respondents had an income of approximately R2000 per month (see Appendix 3 - Demographic Analysis Results- Figure 11 - Income Distribution).

## **5.4 Descriptive Statistics**

### **5.4.1 Cell phone Use**

Of the 126 respondents sampled, 103 (82%) of the respondents, were on a prepaid service, and almost all respondents indicated that they owned a cell phone, with only 4% indicating that were sharing a cell phone with someone else (see Table 6)

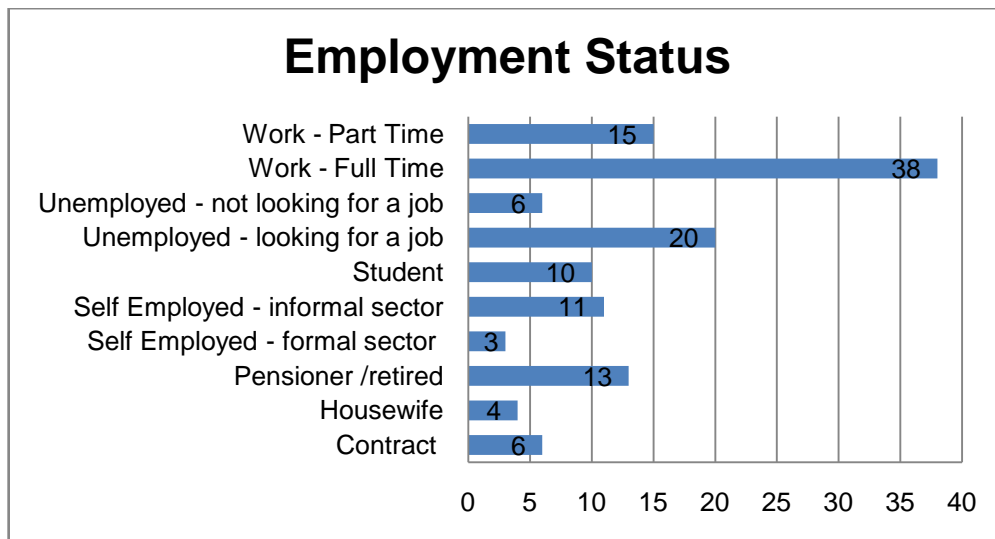
**Table 6 - Cell phone usage**

Cell Phone Use	Contract		Prepaid		No response		Grand Total
Own a cell phone	18	15%	98	82%	4	3%	120 (95%)
Share a cell phone			5	83%	1	17%	6 (5%)

### 5.4.2 Employment Status

An aggregated view of the sample, revealed that overall 32% were unemployed based on the broad unemployment rate definition, which was on a par with the 34% broad unemployment rate for Gauteng (Provincial Decision-Making Enabling (PROVIDE) , 2009) , see Figure 7.

**Figure 7 - Employment Status**

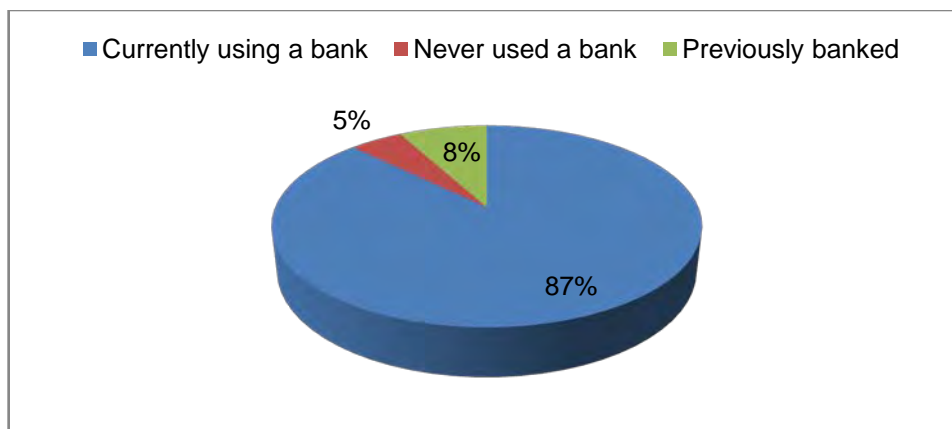


### 5.4.3 Banking Status

The majority of respondents (87%) surveyed indicated that they had a bank account, 8% were previously banked and 5% had never had a bank account (see

Figure 8).

**Figure 8 - Banking Status**



### 5.4.4 Intention to Adopt m-banking

All respondents were asked to indicate whether they would adopt m-banking and the results are in

**Table 7** below.

**Table 7- m-banking intention to adopt**

M-banking Adoption	Number of respondents	Percentage
Yes	67	53%
No	23	18%
Uncertain	36	29%

Over half (53%) of respondents indicated that they would be willing to adopt m-banking. It was also found that although the majority of those that indicated that they were willing to adopt m-banking were currently using a bank, the same could not be said of those that were uncertain over m-banking adoption or those that indicated that they would not adopt m-banking (see Table 8).

**Table 8 - Banking Status and Intention to adopt m-banking**

Banking Status	Intention to adopt m-banking				
	No	Uncertain	Yes	<i>Grand Total</i>	
Currently using a bank	22	27	61	110	<b>87%</b>
Never used a bank	1	3	2	6	<b>5%</b>
Previously banked		6	4	10	<b>8%</b>
<i>Grand Total</i>	23	36	67	126	<b>100%</b>

## 5.5 Inferential Descriptive Statistics

### 5.5.1 Analysis of Variance

The respondents were grouped according to their intention to adopt m-banking and the means of the variables were compared across these groups to assess the extent of the differences between the attitudes and perceived behavioural control of those who intended to adopt m-banking compared to those who were unsure and those that would not adopt m-banking. The results are shown in Table 9 below.

**Table 9 - 1 Way ANOVA by Intention to Adopt**

Variable	P=	Kruskal-Wallis H ( 2, N= 126)	Mean Yes	Mean Uncertain	Mean No
Relative Advantage (RA)	0.005	10.36	3.51	2.97	2.78
Compatible with Values (CV)	0.000	24.35	3.66	3.35	2.37
Complexity (CX)	0.009	9.82	2.46	2.92	3.10
Trialability(TR)	0.000	17.00	3.83	4.03	2.72
Cell phone Experience (CE)	0.001	12.25	4.04	3.65	3.52
Banking Needs (BN)	0.000	18.31	3.87	3.52	2.91
Risk RS)	0.039	6.81	3.11	3.38	3.52
Self-efficacy (SE)	0.001	17.62	3.40	3.16	2.34

Marked effects are significant at  $p < .05000$ . Therefore based on the p values of all the differences, it can be concluded that the differences between the three groups with respect to the 8 variables are statistically significant. The null hypothesis that, there are no significant differences between the groups' mean scores is therefore rejected at  $p < .05000$ . The variances are discussed in more detail in paragraph 5.5.3 below.

### 5.5.2 Correlation of Variables

The relationships that have the highest correlation are between Relative Advantage and Compatibility with Values and Cell Phone Experience. There was a high negative correlation between Complexity and almost all the other variables except Trialability and Risk. Lastly, the Banking Needs variable was highly correlated to Cell Phone Experience.

**Table 10 - Statistical Significance of Correlations**

	RA	CV	CX	TR	CE	BN	RS	SE
RELATIVE ADVANTAGE (RA)	1.00	0.70	-0.61	0.03	0.63	0.46	-0.45	0.42
COMPATABLE WITH VALUES (CV)	0.70	1.00	-0.57	0.17	0.46	0.42	-0.53	0.62
COMPLEXITY (CX)	-0.61	-0.57	1.00	-0.04	-0.54	-0.50	0.55	-0.55
TRIALABILITY (TR)	0.03	0.17	-0.04	1.00	0.09	0.28	-0.02	0.18
CELLPHONE EXPERIENCE (CE)	0.63	0.46	-0.54	0.09	1.00	0.60	-0.22	0.39
BANKING NEEDS (BN)	0.46	0.42	-0.50	0.28	0.60	1.00	-0.17	0.51
RISK (RS)	-0.45	-0.53	0.55	-0.02	-0.22	-0.17	1.00	-0.47
SELF-EFFICACY (SE)	0.42	0.62	-0.55	0.18	0.39	0.51	-0.47	1.00

### 5.5.3 Propositions

The 9 variables were analysed to identify the overall attitudes and perceived behavioural control of the surveyed respondents.

#### 5.5.3.1 Relative Advantage

Overall the respondents, irrespective of their intention to adopt m-banking, agreed (M =3.22, SD=1.11) that m-banking was offering an advantage over their current way of managing money.

The group of respondents that indicated that they would adopt m-banking had a more positive view of the extent to which m-banking could offer an advantage over their current way of managing money as compared to those who were uncertain or would not adopt m-banking,  $H(2, N=126) = 10.36, p = .005$  (see **Table 9**).

The extent to which m-banking was viewed as offering an advantage over their current way of managing money was positively correlated with the respondents' perception of the extent to which m-banking was consistent with the individual's values, ( $r(124) = .70, p < .05$  see Table 10). There was also a high positive correlation with between the extent to which m-banking was viewed as offering an advantage over their current way of managing money and those who with sufficient experience using mobile phone technology and applications, ( $r(124) = .63, p < .05$  see **Table 10**). A strong negative correlation was found between m-banking being viewed as offering a relative advantage with the degree to which m-banking was considered difficult to understand and use, ( $r(124) = -.61, p < .05$  see **Table 10**).

#### 5.5.3.2 Compatibility with Values

The respondents surveyed viewed m-banking as being consistent with their individual values ( $M=3.32, SD=1.01$ ).

The group of respondents that indicated that they would adopt m-banking and those that were uncertain agreed that m-banking was consistent with their individual values, whereas those that indicated they would not adopt m-banking disagreed  $H(2, N=126) = 24.35, p = .000$  (see **Table 9**).

Compatibility with individual values was found to also have a strong positive correlation with self-efficacy, being the individuals confidence in their ability to use m-banking,  $r(124) = .62, p < .05$  (see **Table 10**).

### 5.5.3.3 Complexity

Overall the respondents were of the perception (Mean=2.72, SD=1.00) that m-banking would be difficult, frustrating and require a lot of effort.

The group of respondents that indicated that they would not adopt m-banking had the perception that m-banking would be difficult to understand and use,  $H(2, N=126) = 9.82, p = .009$  (see **Table 9**), whereas those that indicated that they would adopt m-banking did not believe that m-banking would be difficult or complex to use. Those that were uncertain appeared mostly neutral about the level of difficulty associated with m-banking.

Complexity had significant negative correlations with all variables with the exception of risk and trialability. Complexity had a positive correlation with Risk,  $r(124) = .55, p < .05$  (see **Table 10**). There was no correlation with the trialability variable.

### 5.5.3.4 “Trialability”

The respondents surveyed agreed that that they would like an opportunity to experiment with m-banking before committing to using it (M=3.69, SD= 1.19).

The group of respondents that indicated they would not adopt m-banking disagreed that being given an opportunity to experiment with m-banking would make them adopt m-banking,  $H(2, N=126) = 17.00, p = .000$  (see **Table 9**). It was also found that the group of respondents that were uncertain about adoption had the highest mean for trialability, indicating that they placed a higher value on being able to experiment with m-banking before making a decision about adopting.

'Trialability' had no strong positive or negative correlations with any of the other variables (see **Table 10**).

#### **5.5.3.5 Cell Phone Experience**

The respondents surveyed used their cell phones regularly and considered themselves as having sufficient cell phone experience ( $M = 3.83, SD = 0.69$ ).

Although the adopters appeared more confident in their own experience using mobile phone technology and applications compared to the non-adopters and uncertain respondents, most respondents felt that they had sufficient cell phone use experience,  $H(2, N=126) = 12.25, p = .001$  (see **Table 9**).

Cell phone experience was highly correlated to the relative advantage variable,  $r(124) = .63, p < .05$  and Banking needs variable,  $r(124) = .60, p < .05$  (see **Table 10**).

### 5.5.3.6 Banking Needs

The respondents had a positive perception of the extent to which m-banking could meet their banking products and services needs ( $M=3.60$ ,  $SD=0.81$ ).

As expected, the adopters indicated that m-banking would meet their individual banking products and services needs whereas the non-adopters had a negative perception of whether m-banking would address their banking needs and services,  $H(2, N=126) = 18.31$ ,  $p = .000$  (see **Table 9**). Interestingly, the uncertain respondents also agreed that m-banking was compatible with their banking needs, inferring that other variables may be causing uncertainty and therefore preventing adoption of m-banking.

As discussed in paragraph 5.5.3.2, the extent to which m-banking was perceived to be able to address individual banking needs was found to have a strong positive correlation with cell phone experience. It was also positively correlated to the individuals self-confidence in their ability to use m-banking,  $r(124) = .51$ ,  $p < .05$  (see **Table 10**).

### 5.5.3.7 Risk

The respondents believed that there was a sense of risk concerning conducting financial transactions by cell phone ( $M= 3.27$ ,  $SD=0.76$ ).

The non-adopters ( $M=3.52$ ) had a higher sense of risk related to conducting financial transactions by cell phone compared to the adopters ( $M=3.11$ ) and the uncertain adopters ( $M=3.52$ ),  $H(2, N=126) = 6.81, p = .039$  (see **Table 9**).

The perception of risk related to m-banking was negatively correlated to all the variables with the exception of Complexity (see **Table 10**). This was expected as both were negatively skewed towards intention to adopt

#### **5.5.3.8 Self-efficacy**

The respondents indicated that they had self-confidence in their ability to use m-banking ( $M= 3.19, SD=1.05$ ).

The adopters ( $M=3.40$ ) had a higher confidence in their ability to use m-banking than the uncertain adopters ( $M=3.16$ ),  $H(2, N=126) = 17.62, p = .001$  (see **Table 9**). The non-adopters showed a lack of confidence in their ability to use m-banking ( $M=2.34$ ).

The consumer's perception of their own ability was positively correlated with the consumers perception of the extent to which m-banking was aligned with their values (see **Table 10**).

#### 5.5.4 Factor Analysis

Factor analysis is a collection of methods used to examine how underlying constructs describe the responses on a number of measured variables (DeCoster, 1998). Factor analysis was used to identify the nature of the constructs underlying responses within the identified variables. Generally, the 1st factor is more related to the variables than subsequent factors because subsequent factors account less and less for the variance between variables (StatSoft, Inc., 2011). Using Varimax rotation and eigen values exceeding one, three factors were identified which together explained 71% percent of the variance for the entire set of variables. See Appendix 4.

Factor 1, labelled **Advantage**, accounted to 44 percent of the variance and was marked by high loadings on all 6 items of the Relative Advantage variable as well as 1 item in the Compatibility with Values variable, The items are listed below:

Q9.	m-banking makes it easier for me to conduct my banking transactions.
Q10.	m-banking gives me greater control over my finances
Q11.	m-banking allows me to manage my finances more efficiently.
Q12.	m-banking is a convenient way to manage my finances.
Q13.	m-banking allows me to manage my finances more effectively.
Q14.	I find m-banking useful for managing my financial resources.
Q15.	m-banking is compatible with my lifestyle.

Factor 2, labelled **Confidence**, accounted for 14 percent of the variance and was marked by high loadings for the following items in the self-efficacy variable:

Q37.	I am confident of using m-banking even if I have never used such a system before
Q38.	I am confident of using m-banking if I have just seen someone using it before trying it myself
Q39.	I am confident of using m-banking even if there is no one around to show me how to do it
Q40.	I am confident of using m-banking if I have just the online “help” function for assistance

The last factor, labelled **Banking Needs**, accounted for 13 percent of the variance and was marked by high loadings for the following items in the Banking Needs variable:

Q27.	I would send/receive money to/ from anyone with a bank account
Q28.	I would use airtime as a means of payment for goods and services if there was a zero transaction cost associated to it
Q29.	I would use my phone to deposit, withdraw, or remit cash at any ATM or authorized POS enabled banking agent
Q30.	I would use m-banking if I could switch mobile banking provider, but keep my mobile banking service.

Three clear patterns relation to intention to adopt m-banking among the respondents were identified: the extent to which m-banking offers an advantage over the individual's current way of banking, the role of the individual's self-confidence in using m-banking and the extent to which m-banking addresses the banking needs of the individual.

Further analysis of the factor scores revealed that there was medium to low correlation between the identified factors, see Table 11 below.

**Table 11 - Factor Score Correlation**

<i>r</i>	ADV_FS	CON_FS	BN_FS
ADV_FS	1.000000	0.431434	0.470294
CON_FS	0.431434	1.000000	0.432814
BN_FS	0.470294	0.432814	1.000000

## 5.6 Summary

**Table 12 - Summary of Analysis Results**

No	Proposition	Result	Reason
P1	The extent to which m-banking is viewed as offering an advantage over the current way of managing money, the more likely that m-banking will be adopted.	Supported	ANOVA results (Intention to adopt =Yes): H value =10.36, P=0.01, alpha=0.05, M=3.51
P2	The greater the extent to which m-banking is viewed as being consistent with an individual's values, the more likely that m-banking will be adopted.	Supported	ANOVA results (Intention to adopt =Yes): H value =24.35, P=0.00, alpha=0.05, M=3.66
P3	The greater the degree to which m-banking is considered difficult to understand and use, the less likely that m-banking will be adopted.	Supported*	ANOVA results (Intention to adopt =Yes): H value =9.82, P=0.01, alpha=0.05, M=2.46
P4	The greater the extent to which users had an opportunity to experiment with m-banking before committing to using it, the more likely that m-banking will be adopted	Supported	ANOVA results (Intention to adopt =Yes): H value =17.00, P=0.00, alpha=0.05, M=3.83
P5	The greater the extent to which the consumer has previous experience using mobile phone technology and applications, the more likely that m-	Supported	ANOVA results (Intention to adopt =Yes): H value =12.25, P=0.00,

	banking will be adopted.		alpha=0.05, M=4.04
P6	The greater the extent to which m-banking meets the individual's needs for banking products and services, the more likely that m-banking will be adopted	Supported	ANOVA results (Intention to adopt =Yes): H value =18.31, P=0.00, alpha=0.05, M=3.87
P7	The greater the perceived sense of risk concerning conducting financial transactions by cell phone, the less likely that m-banking will be adopted	Supported	ANOVA results (Intention to adopt =Yes): H value =6.81, P=0.04, alpha=0.05, M=3.11
P8	The greater the individual's self confidence in his/her ability to use m-banking, the more likely that m-banking will be adopted	Supported	ANOVA results (Intention to adopt =Yes): H value =17.62, P=0.00, alpha=0.05, M=3.40
P9	The greater the extent to which support from the mobile operators is available, the more likely that m-banking will be adopted	Not Supported	Reliability Analysis: Cronbach's alpha = 0.24 < than .60

## **6. Chapter 6 - Discussion of Results**

### **6.1 Introduction**

The objective of this research was to assess the variables, including the financial services needs, influencing adoption of m-banking by low-income consumers. The literature in Chapter Two described the framework that was used in order to assess the significance of the identified factors in determining m-banking adoption. The propositions in Chapter Three were tested using those variables as predictors of m-banking adoption by low-income consumers.

The statistical analyses performed and results were outlined in Chapter Four and Five respectively and the results confirmed most of the propositions in Chapter Three. This chapter will discuss the individual propositions to better understand the effect on the adoption of m-banking and make recommendations for the use of m-banking as an effective way of providing financial services to low-income consumers.

### **6.2 Discussion of the Propositions**

#### **6.2.1 Relative Advantage**

Proposition 1 stated that the extent to which m-banking is viewed as offering an advantage over the current way of managing money, the more likely that m-banking will be adopted.

Rogers (1995, pp. 15-16) defined relative advantage as the degree to which an innovation is perceived as better than the idea it supersedes. According to (Agarwal & Prasad, 1998) the relative advantage of an innovation is positively related to its adoption. Based on this, the expectation was that relative advantage would have a significant and positive impact on m-banking adoption.

The results in **Table 9** show that relative advantage had a significant effect on m-banking adoption. The group of respondents that indicated that they would adopt m-banking, had a positive view of the extent to which m-banking could offer an advantage over their current way of managing money as compared to those who were uncertain or would not adopt m-banking. The strong relationship between relative advantage and cell phone experience also seems to indicate that there is merit to theory that suggests that growth in cell phone use has had transformational effects in low income populations. It was expected that those that thought m-banking would be difficult to understand use did not see it as offering an advantage over their current way of banking. Lastly, the results of the Factor Analysis showed that relative advantage was the most significant factor in describing adoption of m-banking.

The analysis results reinforce and support the previous literature in that relative advantage has a significant positive impact on the intention to adopt m-banking. It also supports Porteus' (2007) theory of the transformational effect of m-banking as

potential adopters view it as offering an advantage over their current way of banking. The results support the proposition.

### 6.2.2 Compatibility with Values

Proposition 2 stated that the greater the extent to which m-banking is viewed as being consistent with an individual's values, the more likely that m-banking will be adopted.

Rogers (1995, pp. 15-16) defined compatibility as the degree to which an innovation is perceived as being consistent with the existing values of the potential adopters. Barki and Parente (2010) found that consumer behaviour of the Base of the Pyramid market in Brazil differed from that of their better off countrymen in that they had a different configuration of the perception of value. Therefore, it was expected that the extent to which the individual perceived m-banking to be consistent with their value systems would have a positive impact on m-banking adoption.

The results in **Table 9** show that compatibility with values had a significant effect on m-banking adoption. The group of respondents that indicated that they would adopt m-banking as well as those that indicated that they were uncertain, mostly agreed with the view that m-banking was compatible with their value systems than those who were uncertain or would not adopt m-banking.

The analysis results support the literature in that the extent to which an innovation is perceived as being consistent with the existing values of the potential adopters, positively influences adoption. The results support the proposition

### 6.2.3 Complexity

Proposition 3 stated that the greater the degree to which m-banking is considered difficult to understand and use, the less likely that m-banking will be adopted

Complexity was defined as the degree to which an innovation is considered relatively difficult to understand and use and was found to negatively influence the adoption of m-banking Cheung et al. (2000). Rogers (1995, p. 212) posited that innovations that were simpler to understand were adopted more rapidly than the innovations that required the adopter to develop new skills and understanding. Therefore, it was expected that the low-income consumers' perception of m-banking's level of difficulty would have a negative effect on adoption.

The results in **Table 9** show that complexity had a significant negative effect on m-banking adoption. The group of respondents that indicated that they would not adopt m-banking had a high perception of the risk and level of difficulty associated with m-banking.

The analysis results support the literature in that the potential adopters' perception of the level of difficulty and understanding of m-banking, has a negative influence on adoption. The results support the proposition.

#### **6.2.4 Trialability**

Proposition 4 stated that the greater the extent to which users had an opportunity to experiment with m-banking before committing to using it, the more likely that m-banking will be adopted.

Potential adopters who had an opportunity to experiment with an innovation would feel more comfortable with it and would therefore be more likely to adopt it ( (Rogers, 1995) and Tan and Teo (2000)). However, Akturan and Tezcan (2010) found that “trialability” did not influence adoption of an innovation.

The results in **Table 9** show that “trialability” had a significant effect on m-banking adoption. The results also showed that respondents that were uncertain about their intention to adopt placed higher importance to the opportunity to experiment with m-banking prior to committing, whereas the opportunity to experiment with m-banking would not sway the non-adopters.

The analysis results support (Rogers(1995) and Tan and Teo (2000)) in that the ability to experiment with m-banking before committing would have a positive impact on adoption. In the case of non-adopters, the opportunity to experiment with

m-banking would not change their intention to adopt. Therefore “Trialability” on its own cannot be taken as a reliable predictor of m-banking adoption as a consumer may experiment with m-banking and still decide not to adopt it.

The proposition is supported in as far as it applied to people that indicated they would adopt m-banking and those that were uncertain about adoption. It was not supported in the instance of those that indicated they would not adopt m-banking.

#### **6.2.5 Cell Phone Experience**

Proposition 5 stated that the greater the extent to which the consumer has previous experience using mobile phone technology and applications, the more likely that m-banking will be adopted.

Chung and Kwon (2009) defined mobile experience as a general experience with mobile services such as short messaging service (SMS), mobile broadcasting, mobile gaming, mobile learning, and mobile shopping, and not as an experience with one particular mobile service. They went further to add that experience could increase users’ confidence in their ability to master and use new technology.

The results in Table 9 show that cell phone experience had a significant effect on m-banking adoption, however irrespective of intention to adopt respondents indicated that they considered themselves as having sufficient cell phone usage experience.

The results partially support the suggestion by Hoppe et al.(2001) that the greater the experience using the internet, the more likely that internet banking would be adopted, similarly with mobile phones and m-banking. With respect to adopters and uncertain groups, the proposition is not supported however, as despite considering themselves as having sufficient cell phone experience, the non-adopters still did not wish to adopt m-banking.

### **6.2.6 Banking Needs**

Proposition 6 stated that the greater the extent to which m-banking meets the individual's needs for banking products and services, the more likely that m-banking will be adopted.

The poor are a diverse group of vulnerable households with complex livelihoods requiring a full set of micro financial services (Martin, Hulme, & Rutherford, 1999). Most financial services providers assumed that the poor, by virtue of being poor, had no money to transact and therefore ignored them as a customer segment. However the poor have valid financial services needs and Hoppe et al.(2001) theorised that the greater the use of banking products and services, the more likely that internet banking would be adopted. Therefore, the extent to which m-banking can service the financial services needs of low-income consumers, it was expected that m-banking will be adopted.

The results in **Table 9** show that compatibility with banking needs had a significant effect on m-banking adoption. More significantly, banking needs was one of the three factors that had the most impact on intention to adopt m-banking. This is in line with the expectation that the more m-banking is perceived as meeting the banking needs of low-income consumers, the more likely it is that it will be adopted. The results support the proposition.

### **6.2.7 Risk**

Proposition 7 stated that the greater the perceived sense of risk concerning conducting financial transactions by cell phone, the less likely that m-banking will be adopted.

Tan and Teo (2000) found that perceived security and privacy risk could be a major impediment to the adoption of internet banking, as such, it was expected that the perception of risk underlying m-banking would have a negative effect on the adoption of m-banking.

The results in **Table 9** show that perception of risk does have a negative impact on intention to adopt m-banking. Risk also had a negative correlation to all other variables tested, supporting the view of perception of risk as an overall impediment to adoption.

### 6.2.8 Self-Efficacy

Proposition 8 stated that the greater the individual's self confidence in his/her ability to use m-banking, the more likely that m-banking will be adopted.

Hoppe et al.(2001) referred to self-efficacy as the individual's self-confidence in their ability to perform a specific task. Bandura (1986) cited in Luo, Li, Zhang, & Shim (2010) defined self-efficacy as a person's perception of how easy or difficult it would be to carry out behaviour. It was expected that it would have a strong positive influence on the adoption of m-banking.

The results in **Table 9** support the view that the more confidence the individual has in their ability to use m-banking, the higher the likelihood of adoption. Self-efficacy was also positively correlated to the compatibility with values variables, it can therefore be inferred that one's value system could have an influence on the level of confidence in using m-banking and therefore adoption. Lastly, factor analysis revealed self-confidence as the second highest factor describing m-banking adoption, highlighting the importance of the individual's perception about his or her own ability to perform certain tasks.

The results support proposition. Self-efficacy had a significant positive effect on m-banking adoption and those that indicated confidence in their ability to use m-banking were also likely to adopt m-banking as opposed to those that lacked confidence.

### **6.2.9 Support**

Proposition 9 stated that the greater the extent to which support from the mobile operators is available, the more likely that m-banking will be adopted.

The results of the reliability analysis (see Table 3) showed that the support variable would not be a reliable indicator of intention to adopt m-banking. The support variable was therefore not used in the statistical analysis. Tan and Teo (2000), citing Goh (1995), defined two types of support: technological and government support. The unreliability of the variable may be attributable to the fact that instead of separating the support variable into two distinct variables, the attributes of both were tested as one variable. Furthermore, previous research found that Support in itself had no influence on m-banking adoption (Tan and Teo (2000), Hoppe et al.(2001)).

Based on the above results, there was insufficient evidence to support the proposition.

### **6.2.10 Summary**

The results of the research show that the financial services needs of the poor are indeed an important factor in m-banking adoption. However, it was found that even more significant than the banking needs of the poor, the relative advantage offered by m-banking and self-confidence of low-income consumers are more significant to m-banking adoption.

One can argue that in order for m-banking to offer a relative advantage over the current way of banking, it would have to meet the financial services needs of the poor as they are currently unmet by traditional banking channels hence they are unbanked. Lack of self-confidence on the part of the consumer was also found to be a factor that could inhibit m-banking adoption even when banking needs are catered for and relative advantage is clearly present.

Lastly, the perceptions of Risk and Complexity associated with m-banking were found to be deterrents to adoption.

## **7. Chapter 7 - Conclusion**

### **7.1 Introduction**

The purpose of this research was to identify the factors that influence m-banking adoption, specifically the importance of the financial services needs of the poor in influencing adoption. Tan and Teo's (2000) framework was adapted and 9 variables were used to assess the predictors of m-banking as well as to identify the factors that most contributed to m-banking. The nine variables were Relative Advantage, Compatibility with Values, Cell Phone Experience, Banking Needs, Complexity, Trialability, Risk, Self-Efficacy and Support.

Of the nine variables, Relative advantage, Banking Needs, and Self-Efficacy had the most significant positive effect in determining intention to adopt m-banking. The implications of the research findings of m-banking adoption and recommendations for the banking industry and government as a key stakeholder are documented in the below sections.

### **7.2 Findings and Implications**

#### **7.2.1 Relative Advantage**

To revisit the definition of relative advantage by Rogers (1995, p 15-16) in Akturan and Tezcan (2010): An innovation offers a relative advantage if it is better than the idea it supersedes. For low-income consumers, this would mean that m-banking

offers a way of managing money which is better than the current scenario, be it through a bank or using other informal means.

m-banking has been linked to economic development (Birkenmaier et al.(2005) and Aker and Mbiti,( 2010)) by previous studies. The inference therefore is that m-banking adoption by low-income consumers would increase their economic participation.

The implication is that more focus is needed by South African bank's advertising and marketing departments on highlighting the product features of m-banking that make it a better financial services channel for low-income users over traditional banking channels. In order to do this, banks need to fully understand how low-income consumers manage their money, including all formal and informal channels.

### **7.2.2 Banking Needs**

One can argue that in order for m-banking to offer a relative advantage over the current way of banking, it would have to meet the financial services needs of the poor as they are currently unmet by traditional banking channels hence they are unbanked.

Birkenmaier and Tyuse Watson (2005) suggested that the financial services and sources of credit available to poor families affected the rate at which families could

be financially empowered through building assets. Therefore, if m-banking were to truly cater to the financial services needs of low-income consumers, it would result in financial empowerment of the poor. In this way, mobile phones could live up to their had potential to bridge the gap between financial institutions and low-income consumers (Mas & Kumar, 2008).

Given the low rate of m-banking adoption, banks should focus on product features and benefits to make sure that they are aligned to the requirements of low-income consumers. Banks should not adopt that a “one size fits all” to m-banking products as research has clearly shown that the needs and values of low-income consumers are different from those of their wealthier counterparts. It is important for South African banks to differentiate between cell-phone banking applications that were traditionally designed as additional channels for existing bank customers and m-banking solutions aimed at the low-income customer segment.

### **7.2.3 Cell Phone Experience and Self-Confidence and Trialability**

Cell phone experience was found to have an impact on the intention to adopt m-banking for the adopters and those that were uncertain, but had no impact on non-adopters. However, considering the various types of cell phones available in the South African market with differing levels of sophistication, cell phone experience could vary vastly across different people.

A more structured definition of cell phone experience that covers types of services used, measures frequency of use and category of phone used could have been a more thorough measure of cell phone experience which could then be used to make inferences about m-banking and cell-phone experience.

Self-confidence may possibly be the factor that inhibits m-banking adoption even when banking needs catered for and relative advantage clearly present. Self-efficacy has very much to do with the individual's perception of his or her own ability. Self-confidence may not be limited to m-banking use but also to cell phone use, especially in more rural settings.

The implication for banks is to invest time in product development and training. When m-banking accounts are setup, consumers should be taken through an induction process, during which, the consumer is be walked through the all functions, messages and notifications associated with the product. This may take time and have cost implications in the form of training personnel, but based on the finding it could also lead to increased adoption.

Lastly, the respondents that were uncertain about m-banking adoption rated trialability as the highest variable affecting their intention to adopt. Considering the fact that they made up 29 percent of sampled respondents, there is merit in taking a closer look at this variable. m-banking solution providers should consider introducing trial periods for their offering. This could be done by letting the

consumer experiment with m-banking for a limited amount of time and using a limited amount of money, after which they could sign up permanently or choose not to.

#### **7.2.4 Government Support**

The extent of the impact of the support variable on m-banking was not determined, however previous research found that support did not have a significant impact on m-banking adoption.

In the South African context, government has played a key role in ensuring that the poor have access to financial services through the Financial Services Charter. The suggestion made by Goh (1995) that government play an intervention and leadership role in the diffusion of innovation is therefore appropriate. The South African banking sector is heavily regulated and as a result, there are limited banking services providers that provide direct services to the low-income segment. It is only recently, that major South African banks have recognised this segment and launched m-banking products to compete with the likes of Wizzit.

The recommendation is for government to deregulate some aspects of banking regulation to enable m-banking solutions that are not dependent on traditional banking licenses to thrive.

### **7.3 Suggestions for Future Research**

This research did not study actual usage post adoption, which would provide valuable insight into whether m-banking did result in economic benefit for the adopters. Future research should delve into the post adoption impact of m-banking on the livelihoods low-income consumers. This would depend on the availability of information about adopters on m-banking services.

The research showed that respondents between the ages of 24 and 35 were most willing to adopt m-banking. The impact of demographic factors such as Age, Gender, Educational background were not explored as part of this research and future work can be done to explore whether these have an effect on intention to adopt m-banking.

### **7.4 Conclusion**

This research contributes to the financial inclusion and Information Technology and Communication for Development (ITC4D) research. Tan and Teo's (2000) framework, which considers the extent to which banking needs coverage affects adoption, was adapted and applied to low-income consumers and m-banking adoption. Whilst there is a slow growth in m-banking adoption, there is a large number of low-income consumers that are unbanked and therein lies the opportunity for m-banking.

The research shows that improvement in current financial management practices, compatibility of financial services needs and self-confidence, have an influence on m-banking adoption. Banks that ensure that their m-banking product offerings address these items will stand a better chance of operating in the low-income market profitably.

## 8. Works Cited

- Agarwal, R., & Prasad, J. (1998). The antecedents and consequents of user perceptions in information technology adoption. *Decision Support Systems* , 22 (1), 15 - 29.
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organisational Behaviour and Human Decision Processes* , 50, 179-21.
- Aker, J. C., & Mbiti, I. M. (2010). Mobile Phones and Economic Development in Africa. *Journal of Economic Perspectives* , 24 (3), 207-232.
- Akturan, U., & Tezcan, N. (2010). The effects of Innovation Characteristics on mobile phone adoption. *10th Global Conference on Business and Economics*. Rome: ABER.
- Bångens, L., & Söderberg, B. (2008). *Mobile Banking - Financial Services for the Unbanked?* Kista: The Swedish Program for ICT in Developing Regions (SPIDER).
- Barki, E., & Parente, J. (2010). *Consumer Behaviour of the Base of the Pyramid Market in Brazil*. São Paulo: Greenleaf Publishing.
- Birkenmaier, J., & Tyuse Watson, S. (2005). Affordable Financial Services and Credit for the Poor: The foundation of Asset Building. *Journal of Community Practice* , 13 (1), 69-85.
- Blumberg, B., Cooper, D. R., & Schindler, P. S. (2008). *Business Research Methods*. Maidenhead: McGraw-Hill Higher Education.
- Brown, I., Cajee, Z., Davies, D., & Stroebel, S. (2003). Cellphone Banking: Predictors of adoption in South Africa - an exploratory study. *International Journal of Information Management* , 23 (5), 381-394.

- Capitec Bank. (2011, July 15). *Our Focus About Us Capitec Bank*. Retrieved July 15, 2011, from Capitec Bank: <http://www.capitecbank.co.za/about-us/focus>
- Centre for Microfinance. (2009). *A Review of the South African Microfinance Sector 2009*. Pretoria : University of Pretoria .
- Chala, A., Dalal, A., Goland, T., Gonzalez, M. J., Morduch, J., & Schiff, R. (2009, October). Half the World is Unbanked. *McKinsey Quarterly* .
- Cheung, W., Chang, M. K., & Lai, V. S. (2000). Prediction of Internet and World Wide Web Usage At Work: A Test of an Extended Triandis Model. *Decision Support Systems* , 30 (1), 83-100.
- Chibba, M. (2009). Financial Inclusion, Poverty Reduction and the Millennium Development Goals. *European Journal of Development Research* , 21 (2), 213-230.
- Chipp, K., & Corder, C. (2009). Where Practice Meets Theory: Defining and Reviewing the Bottom of the Pyramid for South African Marketers. *Paper presented at the International Base of the Pyramid conference*. . Johannesburg , South Africa .
- Chung, N., & Kwon, S. J. (2009). The effects customers' Mobile Experience and Technical Support on the Intention to Use Mobile Banking. *Cyberpsychology and Behaviour* , 12 (5), 539-543.
- Consultative Group to Assist the Poor. (2010, January). Update on Regulation of Branchless Banking in South Africa. *Focus Note* . Johannesburg: Department for International Development (DFID).

- DeCoster, J. (1998, August 1). *Overview of Factor Analysis*. Retrieved September 27, 2011, from Stat-Soft Help: <http://www.stat-help.com>
- Donner, J., & Tellez, C. A. (2008). Mobile Banking and Economic Development: Linking Adoption Impact and Use. *Asian Journal of Communication* , 18 (4), 318-332.
- Duncombe, R., & Boateng, R. (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), 1237-1258.
- Etzo, S., & Collender, G. (2010). The Mobile Phone 'Revolution' in Africa: Rhetoric or Reality? *African Affairs* , 109 (437), 659-668.
- Fourati, K. (2009). Half Full or Half Empty? The contribution of Information and Communication Technologies to Development. *Global Governance* , 15 , 37-42.
- Garcia, R., & Calantone, R. (2002). A Critical Look at Technological Innovation Typology and Innovativeness Terminology: A Literature Review. *International Journal of Bank Marketing* , 26 (5), 282-304.
- Goh, H. P. (1995). The Diffusion of Internet in Singapore. *Academic Exercise* . Faculty of Business Administration National University of Singapore.
- Haupt, P. (2006). *The South African research Foundation*. Retrieved October 3, 2011, from The SAARF Universal Living Standards Measure (SU-LSM™) 12 years of Continuous development: <http://www.saarf.co.za/lsm/lsm-article.htm>
- Hinson, R. E. (2011). Banking the Poor: The role of Mobiles. *Journal of Financial Services Marketing* , 15 (4), 320-333.

Hoppe, R., Newman, P., & Mugeru, P. (2001). *Factors Affecting the Adoption of Internet Banking in South Africa: A Comparative Study*. Cape Town: University of Cape Town.

Infogile Technologies. (2007, August). *Mobile Banking - The future* . Retrieved June 26, 2011, from Infogile : [http://www.infogile.com/pdf/Mobile\\_Banking.pdf](http://www.infogile.com/pdf/Mobile_Banking.pdf)

Israel, G. D. (2009, April). Determining Sample Size. *PEOD6* . Gainesville, Florida, United States of America: Institute.

Ivatury, G., & Pickens, M. (2006). *Mobile Banking and Low Income Consumers* . Washington DC: Consultative Group to Assist the Poor .

Kimenyi, M. S., & Ndung'u, N. S. (2009). *Expanding the financial services frontier: Lessons from mobile phone banking in Kenya* . Washington : Brookings .

Luo, X., Li, H., Zhang, J., & Shim, J. (2010). Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: An empirical study of mobile banking services. *Decision Support Systems* , 49, 222–234.

Martin, I., Hulme, D., & Rutherford, S. (1999). *Financial services for the poor and poorest: Deepening understanding to improve provision*. Manchester: Institute for Development Policy and Management University of Manchester.

Mas, I., & Kumar, K. (2008). *Banking on Mobiles: Why, How, for Whom?* Washington DC: CGAP.

Mattila, M. (2003, May 1). *JIBC*. Retrieved May 12, 2011, from Journal of Internet Banking and Commerce: <http://www.arraydev.com/commerce/jibc/0306-04.htm>

Park, H. M. (2008). *Univariate Analysis and Normality Test Using SAS, Stata, and SPSS*. Indiana University, Working Paper. The University Information Technology

Services (UITS) Center for Statistical and Mathematical Computing. Bloomington: Indiana University.

Porteous, D. (2007). *Just how transformational is M-Banking*. Johannesburg: FinMark Trust.

Porteous, D. (2005). *The Access Frontier as an Approach and Tool in Making Markets work for the Poor*. London: Department for International Development.

Porteus, D. (2006). *The Enabling Environment for Mobile Banking in Africa*. Boston: Bankable Frontier Associates.

Prahalad, C. K. (2005). *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits*. Upper Sadle River: Wharton School Publishing.

Provincial Decision-Making Enabling (PROVIDE) . (2009). *A Profile of the Gauteng Province: Demographics, Poverty, Income, Inequality and Unemployment from 2001 to 2007*. Cape Town : PROVIDE .

Ramburn, H., & Van Belle, J.-P. (2011). Inhibitors and Enablers of Mobile Data Service Use in South Africa. *Communications of the IBIMA* , 2011, 1-11.

Rangan, K. V., & Lee, K. (2011, June 9). Mobile Banking for the Unbanked. *Harvard Business Case* , 1-27. Boston: Harvard Business School Publishing.

Rogers, E. M. (1995). *Diffusion of Innovations* (4th Edition ed.). New York : The Free Press .

Rutherford, S. (1999). *The Poor and their Money*. Manchester : Institute for Development Policy and Management.

Shen, Y.-C., Huang, C.-Y., Chu, C.-H., & Hsu, C.-T. (2010). A benefit-cost perspective of the consumer adoption of the mobile banking system. *Behaviour & Information Technology* , 29 (5), 497–511.

Sinkkonen, S., Laukkanen, P., Kivijärvi, M., & Laukkanen, T. (2008). Modeling Factors of Consumer Resistance to Mobile Banking. Kuopio, Finland.

South African History Online. (2011, June 03). *South African History Online*. Retrieved from A History of Soweto: <http://www.sahistory.org.za/places/soweto-4>

South African Social Security Agency . (2011). *SASSA Home* . Retrieved August 13, 2011 , from Information on Grants 2010/2011 : <http://www.sassa.gov.za/Portals/1/Documents/d54e383b-7e3d-4c96-8aa2-4cc7d32bc78f.pdf>

StatSoft, Inc. (2011, September 22). *Electronic Statistics Textbook*. Retrieved September 22, 2011, from StatSoft Electronic Statistics Textbook: <http://www.statsoft.com/textbook/>

Tan, M., & Teo, T. S. (2000). Factors influencing the adoption of Internet Banking. *Journal of the Association for Information Systems* , 1 (5), 1-44.

Tata Consultancy Services . (2009). *Banking Case Studies* . Bangalore: TCS BaNCS.

Tejerina, L., Bouillon, C., & Demaestri, E. (2006). *Financial services and poverty reduction in Latin America and the Caribbean*. Washington DC : Inter-American Development Bank.



## 9. Appendix 1 - Questionnaire

### MOBILE BANKING (m-banking)

#### Section 1 - Cell Phone Use Profile

1 Please indicate your cell phone use status:

- Own a cell phone  
 Share a cell phone  
 Rent/Lease a cell phone

2 Please indicate by ticking the appropriate box the type of cell phone service you have:

- Prepaid  
 Contract

#### Section 2 - Demographics

3 Please indicate your gender:

- Male  Female

4 Please specify your age by ticking the appropriate box:

- 21-24  25-34  35-44  45-49  50 and above

5 Please indicate your employment status by ticking the appropriate box:

- Pensioner /retired  Student  
 Unemployed - not looking for a job  Housewife  
 Unemployed - looking for a job  Work - Part Time  
 Self Employed - informal sector  Work - Full Time  
 Self Employed - formal sector  
 Contract

6 Please specify your personal average monthly income by ticking the appropriate box:

- R1 – R499  
 R500 – R999  
 R1000 – R1499  
 R1500 – R1999  
 R2000 – R2499  
 R2500 – R2999  
 R3000 – R3499  
 R3500 – R3999  
 >R 4000

7 Please indicate Frequency of your income:

- Daily  Weekly  Monthly  Irregularly  Seasonally

8 Please tick the option that describes your **current** banking status:

- Never used a bank** meaning you have never had a banking account
- Previously banked** meaning you have had a bank account in the past but this is no longer active.
- Currently using a bank** meaning you currently have an active bank account.



## MOBILE BANKING (m-banking)

### Section 3 - Mobile Banking

Are you currently using any of the below products:

- Vodacom M-Pesa  
 Wizzit  
 MTN Mobile Money  
 Other m-banking application  
 I am not familiar with any m-banking products

*Relative Advantage - the extent to which m-banking is viewed as offering an advantage over their current way of managing their money*

		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
RA	9 m-banking makes it easier for me to conduct my banking transactions.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
RA	10 m-banking gives me greater control over my finances.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
RA	11 m-banking allows me to manage my finances more efficiently.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
RA	12 m-banking is a convenient way to manage my finances.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
RA	13 m-banking allows me to manage my finances more effectively.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
RA	14 I find m-banking useful for managing my financial resources.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

*Compatibility with Values - the extent to which m-banking is viewed as being consistent with the individuals values*

		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
CV	15 m-banking is compatible with my lifestyle.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
CV	16 Using m-banking fits well with the way I like to manage my finances.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

*Complexity - the degree to which m-banking is considered difficult to understand and use*

		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
CX	17 m-banking is difficult to use	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
CX	18 m-banking requires a lot of time and effort to use	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
CX	19 m-banking may be frustrating	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

*Trialability - the extent to which users would like an opportunity to experiment with m-banking before committing to using it*

		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
TR	20 I want to be able to try m-banking for at least one month.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
TR	21 I want to be able to use m-banking on a trial basis to see what it can do.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree



*Cell phone experience - previous experience using mobile phone technology and applications*

		<b>Strongly Disagree (1)</b>	<b>Disagree (2)</b>	<b>Neutral (3)</b>	<b>Agree (4)</b>	<b>Strongly Agree (5)</b>	
CE	22	I have been using a cell phone for at least longer than 1 year	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
CE	23	I use my cell phone frequently	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
CE	24	Intensity of cell phone usage - I use most, if not all of my phones functionality	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
CE	25	I am very skilled at using my cell phone	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
CE	26	I know less about using cell phones than most users.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

*Banking Needs - the extent to which m-banking meets the individuals banking products and services needs*

		<b>Strongly Disagree (1)</b>	<b>Disagree (2)</b>	<b>Neutral (3)</b>	<b>Agree (4)</b>	<b>Strongly Agree (5)</b>	
BN	27	I would send/receive money to/ from anyone with a bank account.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BN	28	I would use airtime as a means of payment for goods and services if there was a zero transaction cost associated to it	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BN	29	I would use my phone to deposit, withdraw, or remit cash at any ATM or authorized POS enabled banking agent (e.g. Spaza shop)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BN	30	I would use m-banking if I could switch mobile banking provider, but keep my mobile banking service.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

*Risk - the perceived sense of risk concerning conducting financial transactions by cell phone*

		<b>Strongly Disagree (1)</b>	<b>Disagree (2)</b>	<b>Neutral (3)</b>	<b>Agree (4)</b>	<b>Strongly Agree (5)</b>	
RS	31	m-banking is a risky way of banking	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
RS	32	I would be concerned about the security aspect of m-banking	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
RS	33	Information regarding my m-banking transactions can be tempered with by others	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
RS	34	I would consider having my salary or main source of income paid into a mobile phone bank account.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree



*Self Efficacy - An individuals self confidence in his/her ability to use m-banking*

		<b>Strongly Disagree (1)</b>	<b>Disagree (2)</b>	<b>Neutral (3)</b>	<b>Agree (4)</b>	<b>Strongly Agree (5)</b>	
SE	35	I am confident of using m-banking only if I have instructions for reference.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SE	36	I am confident of using m-banking even if I have never used such a system before.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SE	37	I am confident of using m-banking if I have just seen someone using it before trying it myself.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SE	38	I am confident of using m-banking even if there is no one around to show me how to do it.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SE	39	I am confident of using m-banking if I have just the online "help" function for assistance.	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

*Support - the extent to which support from the government and other institutions is available*

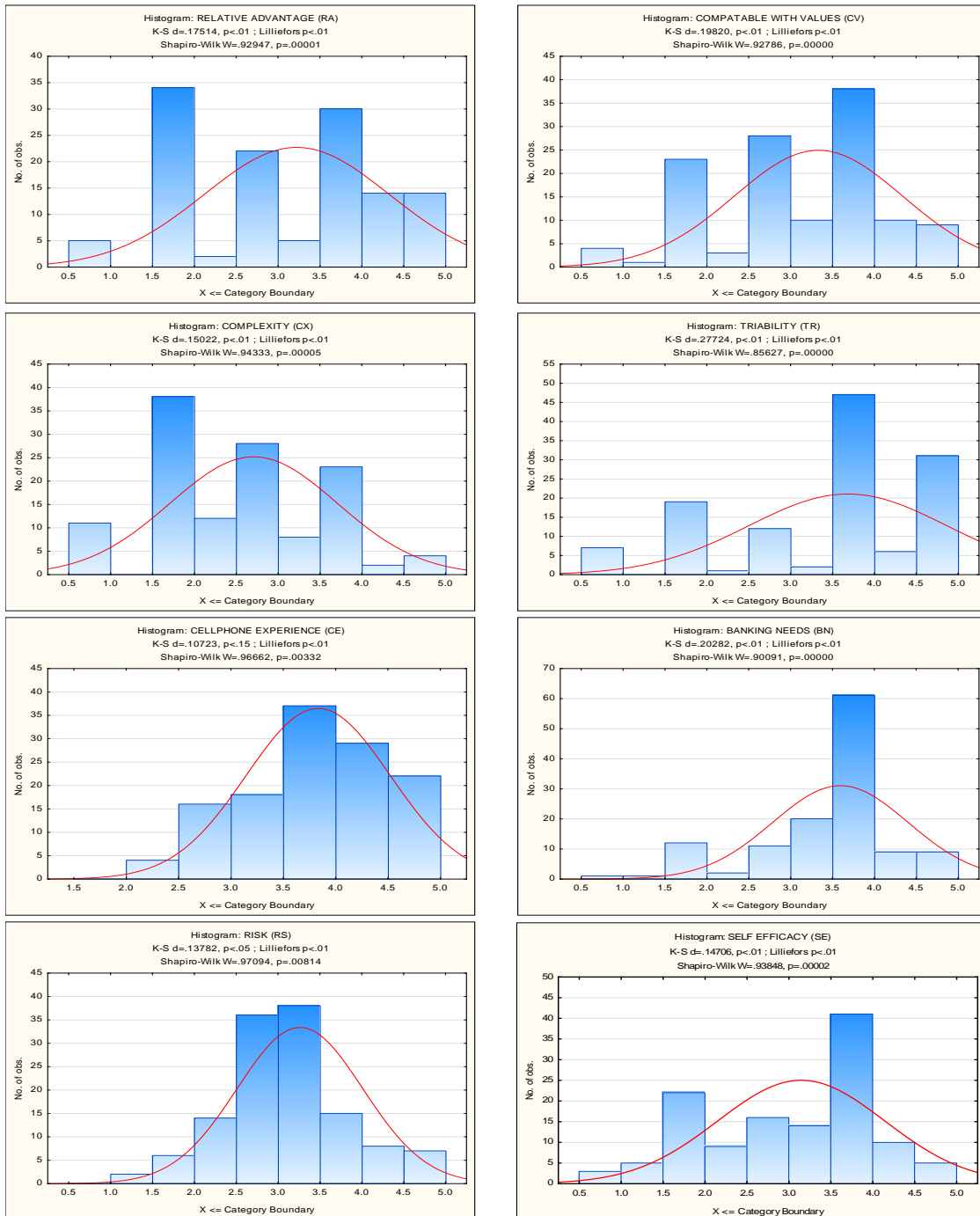
		<b>Strongly Disagree (1)</b>	<b>Disagree (2)</b>	<b>Neutral (3)</b>	<b>Agree (4)</b>	<b>Strongly Agree (5)</b>	
SP	40	I would use m-banking if it had government support	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SP	41	I would use m-banking if there was substantial support available from the network service providers (i.e. Cell C, Vodacom or MTN)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SP	42	I would use m-banking if there was substantial support available from the bank providing it (i.e. Standard Bank, First National Bank, ABSA, Nedbank, Capitec)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

43 Please indicate if you would use m-banking to perform any of the following transactions (tick all that apply) :

Transaction	Tick to select
I am unsure if I would perform any financial transactions using my mobile phone	
Transfer/Send money	
Save/Store money	
Buy Airtime	
Pay for electricity	
Pay Store Accounts	
Check Account Balance	
None of the above	

## 10. Appendix 2 - Data Distribution

### Figure 9 - Data Distribution



## 11. Appendix 3 - Demographic Analysis Results

Figure 10 - Age Distribution

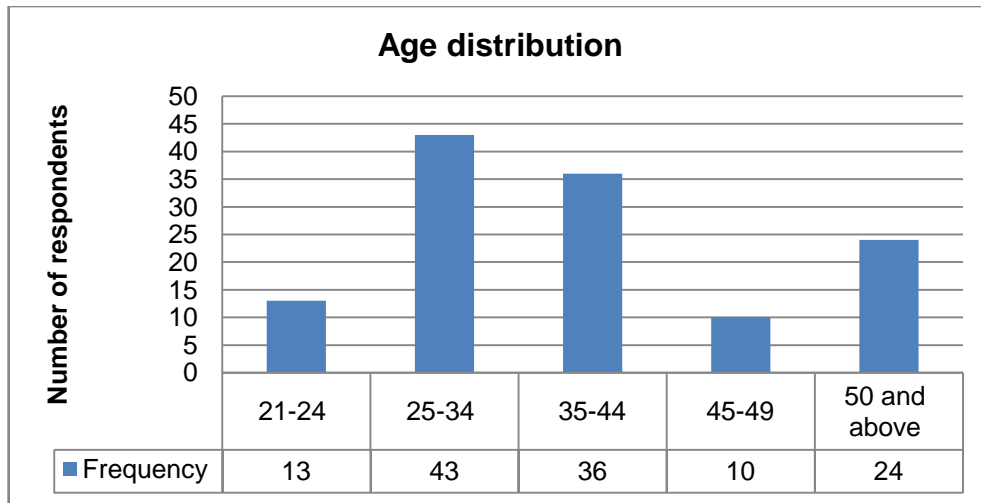
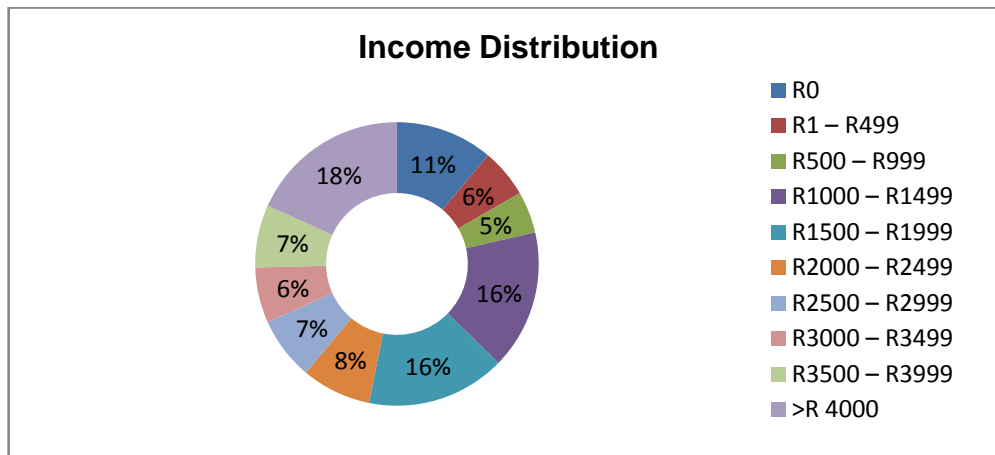


Table 13 - Gender Representation

Gender	Number of respondents	Percentage
Female	57	45%
Male	69	55%

Figure 11 - Income Distribution



## 12. Appendix 4 - Factor Loadings

**Table 14 - Factor Loadings**

Extraction: Principal components (Marked loadings are >.700000)

	Advantage	Confidence	Banking Needs
mbanking makes it easier for me to conduct my banking transactions.	<b>0.90</b>	0.18	0.15
mbanking gives me greater control over my finances.	<b>0.91</b>	0.06	0.17
mbanking allows me to manage my finances more efficiently.	<b>0.93</b>	0.12	0.15
mbanking is a convenient way to manage my finances.	<b>0.92</b>	0.13	0.15
mbanking allows me to manage my finances more effectively.	<b>0.89</b>	0.13	0.10
I find m banking useful for managing my financial resources.	<b>0.88</b>	0.18	0.17
mbanking is difficult to use	-0.43	-0.26	-0.30
mbanking is compatible with my lifestyle.	0.65	0.50	0.02
Using m banking fits well with the way I like to manage my finances.	<b>0.70</b>	0.50	0.10
mbanking requires a lot of time and effort to use	-0.44	-0.22	-0.29
mbanking may be frustrating	-0.37	-0.32	-0.22
I want to be able to try m banking for at least one month.	0.00	0.05	0.12
I want to be able to use m banking on a trial basis to see what it can do.	0.01	0.07	0.10
I have been using a cell phone for at least longer than 1 year	0.10	-0.03	0.03
I use my cell phone frequently	0.38	0.11	0.31
Intensity of cell phone usage - I use most, if not all of my phones functionality	0.40	0.16	0.58
I am very skilled at using my cell phone	0.56	0.15	0.41
I know less about using cell phones than most users.	0.40	-0.02	0.38
I would send/receive money to/ from anyone with a bank account.	0.35	0.23	<b>0.70</b>
I would use airtime as a means of payment for goods and services if there was a zero transaction cost associated to it	0.09	0.18	<b>0.72</b>
I would use my phone to deposit, withdraw, or remit cash at any ATM or authorized POS enabled banking agent (e.g. Spaza shop)	0.31	0.20	<b>0.76</b>
I would use m banking if I could switch mobile banking provider, but keep my mobile banking service.	0.23	0.19	<b>0.76</b>
mbanking is a risky way of banking	-0.48	-0.37	-0.01
I would be concerned about the security aspect of m banking	-0.22	-0.08	0.08
Information regarding my m banking transactions can be tempered with by others	-0.34	-0.28	-0.14
I would consider having my salary or main source of income paid into a mobile phone bank account.	0.02	-0.36	0.34
I am confident of using m banking only if I have instructions for reference.	0.05	0.20	0.28
I am confident of using m banking even if I have never used such a system before.	0.11	<b>0.87</b>	0.13
I am confident of using m banking if I have just seen someone using it before trying it myself.	0.16	<b>0.87</b>	0.16
I am confident of using m banking if I have just the online "help" function for assistance.	0.21	<b>0.81</b>	0.11
I am confident of using m banking even if there is no one around to show me how to do it.	0.23	<b>0.82</b>	0.13
<b>Eigenvalue</b>	<b>3.5</b>	<b>1.1</b>	<b>1.0</b>
<b>Cumulative%</b>	<b>44</b>	<b>14</b>	<b>13</b>