

https://dspace.org/

Exploring consumer intentions to use the M-pesa financial service: a comparative study of low-income communities in Kenya and South Africa

Osah, Olam

2013-03-15
http://hdl.handle.net/10539/12521

Downloaded from a DSpace repository. https://dspace.org/

Table of Contents

Chapter 1- Introduction 9

1.1 Background to the Study 9

1.2 Research Problem 10

1.3 Problem Statement 11

1.4 Research Questions 12

1.5 Aims and Objectives 12

1.6 Importance of this research 15

1.7 Structure of the Research Report 16

1.8 Chapter Conclusion 17

Chapter 2- Literature Review 18

2.1 Chapter Introduction 18

2.2 Contextualizing the literature review 18

2.3 Mobile Technology in Developing Countries 19

2.4 Historical Context - Mobile Phone adoption in Africa 20

2.4.1 Mobile Phone Adoption in Kenya 21

2.4.2 Mobile Phone Adoption in South Africa 22

2.4.3 Money transfer in Africa 23

2.4.4 The Mobile Money chronicle of Kenya and South Africa 24

2.5 Possible external environmental factors affecting M-pesa adoption in Kenya and South Africa 25

2.5.1 Infrastructural Development 26

2.5.2 Economic Standing 27

2.5.3 Access to financial services 28

2.5.4 Prior methods of money transfer 29

2.5.5 Market Share of service providers - *Safaricom and Vodacom* 29

2.5.6 Agent Network 30

2.5.7 Advertising 30
2.5.8 Fee Structure 31
2.5.9 Technology Platform 31
2.5.10 Summary 32
2.6 The need to explain consumer use of technology in Africa at the individual level. 34
2.7 Prior empirical research into mobile technology adoption within developing countries. 35
2.7.1 Adoption Studies 35
2.7.2 Impact Studies 36
2.7.3 Existing Academic Studies on use and impacts of M-pesa 38
2.7.4 Summary of existing research 38
2.8 Theoretical Underpinnings of the Research Model 39
2.8.1 Technology Acceptance Model (TAM) 40
2.8.2 Consumer Behaviour and Theory of Switching Costs 44
2.9 Research Model 47
2.9.1 Research Model for Research Question 3. 47
2.9.2 Dependent Variable 49
2.9.3 Independent Variables and Proposed Hypotheses 49
2.9.4 Control Variables 55
2.10 Chapter Conclusion 56
Chapter 3- Research Methodology 58
3.1 Chapter Introduction 58
3.2 Research design strategy 58
3.2.1 Research design 58
3.3. Data Collection 60
3.3.1 Data collection method 60
3.3.2 Construction of the Research instrument 60
3.3.3 Unit of analysis 69

3.3.4 Survey Instrument Administration 71
3.4 Data Analysis 71
3.5 Ethical Considerations 74
3.6 Limitations of this study 74
3.7 Chapter Conclusion 75
Chapter 4- Data Analysis 76
4.1 Chapter Introduction 76
4.2 Sample Demographics 76
4.2.1 Current use of M-pesa 81
4.2.2 Mobile phone ownership 81
4.2.3 Bank account ownership 81
4.2.4 Income per annum 82
4.2.5 Education 82
4.2.6 Gender 83
4.2.7 Age 83
4.3 Data Screening and Preparation for analysis 83
4.3.1 Reverse Scoring 83
4.3.2 Missing Data 84
4.3.3 Outliers 87
4.3.4 Test for Common-Methods Bias 88
4.3.5 Pooling of Data 88
4.4. Research Question 2 91
4.4.1 Principal Component Factor Analysis 91
4.4.2 Comparison of Kenya and South African Samples 97
4.4.3 Research Question 3 102
4.5 Chapter Conclusion 113
Chapter 5- Discussions and Interpretations 116

5.1 Chapter Introduction 116
5.2 Research Question 2 116
5.3 Research Question 3 121
5.4 Discussion of the theoretical underpinnings of the work 125
5.5 Post-Hoc Findings 127
5.5.1 Revised Model for intention to use M-pesa 127
5.5.2 Application of the revised model 128
5.6 Chapter Conclusion 129
Chapter 6- Conclusion 130
6.1 Chapter Introduction 130
6.2 Summary of the study 130
6.3 Implications for Stakeholders 131
6.3.1 Practical Contribution 131
6.3.2 Academic Contribution 132
6.3.3 Limitations of this Study 133
6.3.4 Recommendations for future research 134
6.4 Chapter Conclusion 135
7.0 References 136
8.0 Appendices 156
Appendix A- Survey Instrument administered in Kenya 156
Participant Information Sheet 156
Appendix B- Survey Instrument administered in South Africa 161
Participant Information Sheet 161
Appendix C- Items per Construct 166
C 1- Survey Instrument administered in Kenya. 166
C 2- Survey instrument administered in South Africa 170
Appendix D- Interfaces of M-pesa 173

D1 Kenya- SIM Toolkit 173

D2- South Africa- USSD 174

Appendix E- Mann Whitney U-Test 175

Appendix F- Scatter Plots 176

Appendix G- PLS graph model for revised model 180

Appendix H- PLS graph model for Kenya 182

Appendix I- Ethics Clearance Certificate 183

List of Tables

Table 2.1 Demographics of the Federal Republic of Kenya……22

Table 2.2 Demographics of the Republic of South Africa……...23

Table 2.3 Summary of identified differences between the countries of focus for this study

……..33

Table 2.4 Academic published literature on M-pesa…….38

Table 2.5 Synthesis of prior work on switching costs and the service industry……46

Table 3.1 Distinctions between quantitative and qualitative research approaches……59

Table 3.2 Instrument construction……..61

Table 3.3 Modifications made to survey instrument administered in Kenya…….64

Table 3.4 Naming scheme for correlation results……...73

Table 4.1 Profile of Kenyan respondents……77

Table 4.2 Profile of South African respondents……..79

Table 4.3 Income categories and equivalents between the samples…….82

Table 4.4 Reversed scored items……..83

Table 4.5 Missing data…….84

Table 4.6 Cases missing items for pooled data set……..87

Table 4.7 Constructs with identical items in survey instrument administered in both contexts……..89

Table 4.8 Factor analysis of pooled data- Independent variables- TAM & Extended TAM (SN & SE)…….93

Table 4.9 Factor analysis of pooled data- Independent variables- Switching cost……...93

Table 4.10 Factor analysis for dependent variable…….94

Table 4.11 Items dropped during factor analysis- pooled data……..94

Table 4.12 Validity and reliability of instrument……95

Table 4.13 Descriptive statistics…….97

Table 4.14 Mann Whitney U-test……....99

Table 4.15 Summary of the differences between the Kenyan and South African sample...101

Table 4.16 Factor analysis for independent variable- South African sample……...103

Table 4.17 Factor analysis for dependent variable- South African sample……..104

Table 4.18 Items dropped during factor analysis- South African sample…….105

Table 4.19 Validity and reliability of instrument- South African sample…….106

Table 4.20 Pearson's correlation Analysis- South African sample……109

Table 4.21 Path coefficient……110

Table 4.22 Summary of findings……...114

List of Figures

Fig 1.1 Study Roadmap……14

Fig 2.1 Research Model……48

Fig 4.1 PLS Graph- Individual items per construct……111

Fig 5.1 Revised model for intention to use M-pesa……..128

Chapter 1- Introduction

1.1 Background to the Study

Recent times have witnessed increasing availability of mobile technology-based products/services in developing regions such as Africa. One such mobile-based technology is M-pesa financial service.

M-pesa[1] is a mobile-based technology money transfer service which enables customers on the service provider's network[2] to make cash transfers [3]to any mobile phone owner within a specified geographical region. Initially, the service catered for only Consumer-to-Consumer cash transfers, however, its services have been extended to include Business-to-Business, Consumer-to-Business, and Consumer-to-Government cash transfers, amongst others[4].

'Safaricom' (a subsidiary of the Vodafone group), the leading mobile service operator in Kenya, launched M-pesa financial service in March 2007. They targeted the service at unbanked persons (persons without bank accounts). Within the span of a month, the service had attracted over 20,000 users (Hughes & Lonie, 2007). This purportedly surpassed the forecast of Safaricom, and was considered evidence of a gap in the mobile payments market. By 2009, M-pesa had 8.6 million registered users (Safaricom, 2009), and today M-pesa boasts of over 13.5 million customers (Techmtaa, 2011). The rapid adoption of the service threatened banks in Kenya at its launch, prompting a CEO of a leading bank in the country to make the following statement: "Banks that stick to the old model - offering a limited range of services, for often heavy fees, to a limited group of wealthy people - risk being outflanked by the customers they ignore" (Perry & Wadhams, 2011).

Following the success of M-pesa launch in Kenya, Vodacom (also a subsidiary of Vodafone) launched M-pesa service in Tanzania, in April 2008. In contrast to the Kenyan success, the Tanzanian service did not experience high levels of use. A year and two months after the

[1] M stands for Mobile, while *pesa* is 'money' in Kiswahili (Kenya's national language).

[2] Network refers to those operated by Safaricom or Vodacom- the M-pesa service providers.

[3] Cash transfers refer to deposits and withdrawals that involve transfer of money to other M-pesa users and non-users, payment of utility bills, and airtime purchase.

[4] www.safaricom.co.ke/index.php?id=257

service launch, Vodacom informed the public that the number of registered users had reached an unimpressive number of 280,000.

M-pesa was thereafter launched in Afghanistan, and was branded using the local language: "M-paisa". It faced a significant number of challenges, one of the major stumbling blocks being creating awareness amongst potential customers. Notwithstanding, the service is now available in major cities and towns in the country with anecdotal evidence suggesting it is growing in popularity as a way to pay salaries (Bold, 2010).

Vodacom and Nedbank launched M-pesa in South Africa in September, 2010. Although use of the service has been low - 140,000 registered users - after 10 months of its existence (Speckman, 2011), Nedbank and Vodacom are optimistic that within the next three years, they will have about 10 million registered M-pesa users; the logic behind their set target being based on the country's unbanked population of about 13 million (Mcleod, 2010). However, given the varying experiences of Kenya, Tanzania, Afghanistan, and the low early South African use rates, there is a clear need to understand the factors which affect consumer intentions to use M-pesa financial service and how those factors drive use in different countries.

1.2 Research Problem

Research on technology use in general has often been studied from an organizational perspective (Hong & Tam, 2006). Notwithstanding, recent times have witnessed the introduction and use of a range of technology-based products that are more individual/personal oriented. Given this position, Lee (1999) notes that the value of research on use of technology-based products is rooted in the incessant effort to make sense of our world, where users, technology, and social settings are intertwined.

As outlined in the various implementation cases in Africa, there *are observed differences in the extent of consumers' use of M-pesa*. We do not have sufficient information explaining why consumers use of M-pesa was much stronger in one country than the others, thus leaving a gap for investigating the different factors that affect consumer intentions to use M-pesa.

This study attempts to fill this gap by investigating and comparing consumer intentions to use M-pesa in two countries (where the service has been launched). Kenya was selected as a country of focus because M-pesa was first implemented there and the use of the service by

consumers there was quite remarkable. South Africa is chosen because it is a country where the service has recently been launched, and local publications suggest that consumers' use of the service has been quite low.

Furthermore, amongst the four countries where M-pesa has been launched, Kenya and South Africa have the best infrastructure levels. Tanzania has a lower infrastructure level in comparison to Kenya (CIA Factbook, 2012)[5], and this difference in infrastructural development would complicate comparisons of consumer behaviour. The political turmoil in Afghanistan introduces too many external factors that may drive consumer behaviour in that context.

In light of the fact that the service was originally intended for the unbanked population, this study focuses on 'low-income[6]' communities in both countries. There is paucity of Information Systems (IS) research on mobile technology-based financial service use by this segment of society (i.e. unbanked, lower socio-economic consumer groups). As mobile technology-based services continue to emerge and are targeted at these consumer groups, understanding their usage behaviour is paramount.

1.3 Problem Statement

In order to gain a better understanding of consumer use of M-pesa, an investigation of the factors that influence consumer behaviour towards technology use should be carried out on a country by country basis. This enables a contextual analysis on the forces at play in influencing consumer intentions to use M-pesa.

At the moment there are just speculations of the possible factors that could be at play in affecting consumer use in the countries where M-pesa has been implemented. These speculations do not provide us with reliable evidence that could promote or inhibit the use of this mobile financial service. While some of these speculated factors could be influencers of M-pesa use, these views need to be validated empirically.

If no study is carried out on this subject, current and prospective mobile money service providers may end up investing in futile promotions, which jeopardizes their overall

[5] https://www.cia.gov/library/publications/the-world-factbook/geos/tz.html

[6] Low-income communities in this study refer to communities that are mostly occupied by persons who have access to the basic human needs. (see chapter 2- table 2.1 and 2.2)

efficiency and earning potential in current and prospective markets. This study will also benefit low-income consumers in developing contexts to have access to financial services.

1.4 Research Questions

To address the research problem outlined above, this study poses three research questions:

The first question focuses at the level of the individual consumer and aims to identify potential determinants or factors that are likely to influence their usage intentions.

Thus the following research question is posed:

1) What environmental and individual level factors are suggested in the literature as the most *likely* to influence consumer intentions to use M-pesa?

The second question aims to compare results across the two countries as part of an explanation of why the launch of the technology-based financial service has been more successful in Kenya than in South Africa.

Thus the following research question is posed:

2) To what extent do Kenyan and South African consumers differ in their intentions to use M-pesa and in their perceptions of the individual level factors identified by research question 1?

The third question aims to test a model in the country where the launch of the service has been less successful and where the need to understand usage intention is of high contemporary importance.

Thus the following research question is posed:

3) What are the effects of the selected individual level factors on South African consumers' intentions to use M-pesa?

1.5 Aims and Objectives

This study has the following aims:

The primary aim of this exploratory study is to answer the above research questions, thereby contributing to the body of knowledge in the area of M-Commerce-intention to use. More specifically, *the method and objectives of this research are as follows:*

- To address the first research question, the researcher will:

  - Identify external environmental factors from the Mobile Commerce (M-commerce) literature that are likely to influence M-pesa adoption.
  - Identify individual factors from consumer and computing behaviour literatures likely to influence M-pesa adoption.
  - Develop a research model that is informed by this existing literature and theory.

- To address the second research question, the researcher will:

  - Identify two or more low-income communities in Kenya and South Africa that have access to M-pesa financial service but within which there are varying patterns of service use.
  - Operationalize the potential determinants of use as identified from research question 1.
  - Develop a survey instrument to collect data from individual consumers within these communities.
  - Distribute the survey instrument using an intercept protocol.
  - Examine/compare Kenyan and South African consumers in their levels of intentions to use and perceptions/attitudes towards the identified factors.
  - Identify similarities and differences in consumer perceptions and intentions to use M-pesa (as defined by the model's predictor variables) across the two contexts.
  - Offer explanations for any differences observed by considering differences in the two contexts such as the legal, regulatory, cultural, economic, social, and technological environment that might explain:

a) Differences in consumer perceptions of M-pesa.

- To address the third research question, the researcher will:

  - Test the hypothesized research model in the South African context using partial least squares analysis (PLS).

- Finally, the study will discuss and reflect on the practical implications of the research findings and the lessons learned for future research in technology acceptance in developing countries.

Fig 1.1 **The study's roadmap**

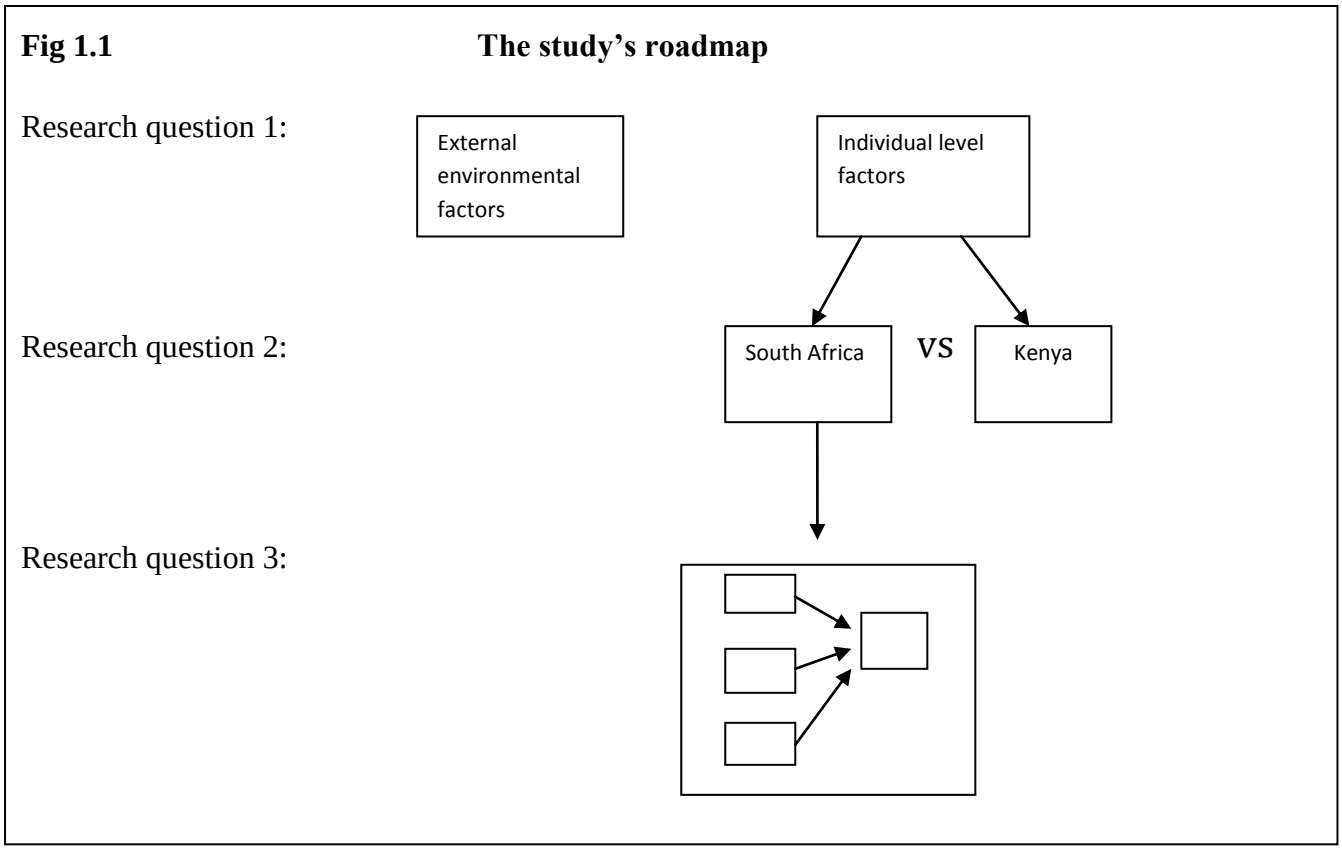


Fig. 1 is a visual depiction of the study's roadmap. It shows the approach taken by the researcher to address the study's research questions.

1.6 Importance of this research

As of 2008, the number of mobile phone users in Africa stood at an estimated 306.5million (Goetz, 2009), and recently, the Global Systems Mobile Association (GSMA, 2010) estimates that close to 364 million underprivileged Africans will use mobile money by the year 2012. The GSMA's estimation presents a large market opportunity but the ability of organizations to succeed in the introduction of commercial products and services that are based on mobile technology platforms will be hampered by a lack of understanding of the factors that *promote* or *inhibit* intention to use these products/services amongst consumers. Furthermore, the Economist (2009) notes that M-pesa is the most successful example of mobile money service in Africa. Yet, as shown in the earlier sections of this chapter, the use patterns of the financial service vary across countries. This research contributes to an improved understanding of these irregular use patterns.

In light of this, the importance of this study will vary across stakeholders:

1. **Practical contribution**: This research will benefit IS practice because the forecast of mobile money users on the African continent will help current and prospective mobile technology-based service providers to better understand their markets and consumer needs. Results of this study will therefore be important to the mobile commerce industry because it will reveal what factors marketers need to focus on in order to attract potential consumers and to retain current consumers of mobile money service.

2. **Academic contribution**: This study extends theory by adding to the body of knowledge in the space of technology acceptance in terms of merging four theories (TAM, TRA, SCT and Switching Cost) to better predict consumer intentions to use technology in different environments.

   Secondly, this study will provide additional empirical evidence concerning the significance of the effects of the model's selected factors on consumer intention to use.

3. **Methodological contribution**: This study will contribute by developing and validating scales to measure variables related to each of the above four theories and to use advanced techniques e.g. PLS[7] to examine their effects on mobile services use.

4. **Contextual contribution**: This study makes two contextual contributions. Firstly, it assesses low-income consumers in two African countries and examines their similarities and differences.

   Secondly, it studies mobile technology-based financial-services in the form of M-pesa.

5. **Global contribution**: This study makes a global contribution in terms of providing some implementation insights (factors that predict consumer intention to use), which may prove valuable for various organizations around the globe that intend to provide other mobile technology-based services in developing countries and economies.

1.7 Structure of the Research Report

The remainder of this report proceeds as follows:

Chapter 2

A literature review is presented on the key findings and significant issues in existing research on technology use in a developing country context. Research question 1 is answered. Factors are drawn from four theories and a model and hypotheses of technology use is developed.

Chapter 3

An extensive discussion of the research design strategy of this study and the execution process is presented. The research instruments and data collection methods in both Kenya and South Africa are discussed, along with the sample techniques employed, the data analysis methods, and justifications for their selection.

[7] PLS is a regression technique that can be employed to test the effects of several predictor variables on a criterion variable.

Chapter 4

This chapter presents the results of tests on the data collected, and depicts them with the use of tables and statistics. This chapter addresses research question 2 and 3.

Chapter 5

The chapter discusses research findings presented in the previous chapter. It reflects on the literature reviewed in Chapter 2, in light of the research findings.

Chapter 6

The last chapter summarizes the research study and, in particular, draws conclusions from its findings. It provides practical insights on the factors that affect African consumers' intentions to use a technology-based product. It also identifies limitations of the study, and makes suggestions for future research.

1.8 Chapter Conclusion

This chapter presented a background to the study, outlined the research problem, research questions, aims and objectives, and the importance of this research. The report's outline was presented.

The next chapter reviews the relevant literature and presents a model of technology use in an African context.

Chapter 2- Literature Review

2.1 Chapter Introduction

This chapter first presents and critically evaluates existing literature in mobile commerce (M-commerce) technology use, current problems in the predicting consumers' intentions to use in Africa and the short-comings and contributions of prior work. These initial sections provide background on the state of M-commerce technology use in Kenya and South Africa. Next, theories on consumer and computing behaviour, namely TAM, TRA, SCT, and Switching Cost are reviewed. This will lead to the identification of factors likely to influence consumers' usage intentions and thereby provide the answer to research question 1. The factors identified provide the basis for understanding differences across Kenyan and South African consumers that is addressed by research question 2. Next, the factors are employed in a research model that predicts usage intentions (that will be the focus of research question 3).

2.2 Contextualizing the literature review

A key point of reference for this study's context is leading developing-country researcher Jonathan Donner's (2008) work on mobile telephony in the developing world. In his study, he reviewed 200 studies that have been carried out on mobile phone adoption in the developing world, and classifies them along two groups. The first group includes studies on: factors affecting mobile adoption, impacts of mobile use, and the links between mobile technology and its users.

The second group explores mobile telephony from an economic development perspective.

The current study aligns to the first group, and more specifically by examining consumer intentions to use [8]M-pesa.

Donner (2008) also notes that although there is a growing increase in the number of studies that are focused on mobile technology use in developing countries, there seems to be a disconnect amongst them, because they are separated by regions and academic disciplines.

This study overcomes the limitation of existing studies that have considered mobile technology use only in a single context by examining and comparing consumer intention to

[8] Intention to use is defined as an individual's self-reported probability of using the M-pesa service when transacting, as well as the individual's preference for the use of M-pesa over other services/methods for transacting.

use M-pesa in two African countries. Secondly, this study overcomes the limitation of single disciplinary perspectives by taking a multi-disciplinary approach in merging appropriate theories that predict consumer intention to use a mobile technology-based service.

2.3 Mobile Technology in Developing Countries

Greengard (2008) suggests that few technological innovations have impacted the world as rapidly as the mobile phone. The year 2006 witnessed developing countries surpass developed countries in the use of mobile phones (Shackleton, 2007). Furthermore, Africa's phenomenal growth in the use of mobile phones has not gone unnoticed by the International Telecommunication Unit (ITU, 2009), which estimates that one in every ten Africans have access to mobile phones and that this ratio is greater in leading African economies such as South Africa, Nigeria, Kenya, and Egypt (Djiofack-Zebase & Keck, 2009).

One fundamental reason for the increase in the rapid use of the mobile phone on the continent is its recent capability to facilitate financial transactions at a much lower cost than traditional channels for financial services (GSMA, 2010). However, several researchers (Agarwal & Karahanna, 2000; Chatterjee, Grewal, & Sambamurthy, 2002; Walsham, 2002) caution that the successful use of a technology-based product in both a developed and developing world context depends on various distinct factors.

There are numerous studies on use of mobile banking in developed countries (e.g. Zhou, Lu, & Wang, 2010; Luo, Li, Zhang, & Shim, 2010; Kim, Chan, & Gupta, 2007; Hsu, Lu, & Hsu, 2007; Wang, Lin, & Luarn, 2006; Luarn & Lin, 2005; Wu & Wang, 2005; Suoranta & Mattila, 2004; Hung, Ku, & Chang, 2003). Few studies, however, tackle the issue from a developing country perspective. Given that the surrounding environments of developed and developing countries differ, models which were produced to predict usage intention in developed country contexts may not adequately predict the usage intention in developing country contexts. Secondly, most M-commerce applications examined in previous studies were not designed for low-income individuals. This is in contrast to those in Africa, where M-pesa was primarily designed for use by that consumer group.

It is worth noting that a few academic and non-academic studies have been conducted on M-pesa. For example, Demombynes and Thegeya (2012) have investigated Kenya's mobile revolution and the promise of mobile savings; Mbogo (2010) has looked at the impact of M-pesa on the success and growth of micro-businesses in Kenya; Ngugi, Pelowski, and Ogembo

(2010) examined the part played by early adopters in the diffusion of M-pesa; Morawcynski and Miscione (2008) produced a case study on the role of trust in M-pesa; Morawcynski (2008) examined how M-pesa is fostering urban-to-rural remittances in Kenya; and Jack and Suri (2011) have investigated the economics of M-pesa, in terms of low cost and the widespread unmet demand for financial services. There are, in addition, a few working papers on the subject at the moment (Mbiti & Weil, 2011; Jack & Suri, 2011).

However, very few academic studies to date have sought to examine and compare consumers' intentions to use M-pesa, in low-income communities, within two developing countries. As shown in the use patterns of the various countries which have implemented M-pesa, there is great variation in consumer use. To this end, it will be a worthwhile investigation to consider the usage intention of individuals in low-income communities in Kenya (where the service was first launched) and in South Africa (where the M-pesa service was recently implemented).

In the next section, the researcher provides information on the state of mobile phone adoption in Africa. This is necessary because M-pesa is a mobile technology-based service. Thus, our understanding of the adoption levels of mobile phones in Africa is necessary to provide a context for examining the M-pesa phenomenon.

2.4 Historical Context - Mobile Phone adoption in Africa

Seventy five percent of the world's countries are classed as developing countries, and Africa is home to most of these countries (Sahay & Avgerou, 2002).

Statistics have shown that Sub-Saharan Africa harbours 690 million people, and represents 88% of the world's least developed countries (Morales-Gomez & Melesse, 1998, p.7), of which the countries of focus for this study (Kenya and South Africa) are member states. Furthermore, the region consists of 43 countries, which have the lowest level of infrastructural development in the world (ITU, 2009; World Bank, 2009). Despite these facts, a point of caution here is that although Kenya and South Africa are situated within this region, they are not classed among the least developed but rather as *developing countries*. This is because of occurring developments in these countries that are evident. While African residents make up the majority of the world's underprivileged population, mobile phone use in the continent has been one of the most phenomenal occurrences of technology use in this

century. This incidence has far exceeded predictions by authorities in the field (Ngugi *et al.* 2010).

Today, access to mobile coverage and use of the device has grown at an astounding pace. In the light of this, the GSMA (2009) notes that in 1999, only 10% of the African continent had access to mobile network coverage, and access was mostly in the northern and southern parts of Africa. However, the year 2008 ushered a new beginning, where 60% (approximately 477 million) of Africa's population as a whole now have access to mobile network coverage (Aker & Mbiti, 2010). The situation in Kenya and South Africa are discussed in more detail next. The discussions will aid our understanding of the different states of mobile phone adoption in the two contexts of focus for this study.

2.4.1 Mobile Phone Adoption in Kenya

Kenya and East Africa as a region have witnessed a phenomenal occurrence in the use of mobile phones (Ngugi *et al.* 2010). In the year 1999, the leading telecommunications service provider in Kenya (Safaricom) estimated that it would attract about 3 million users by the year 2020. Conversely, a decade after this forecast, Safaricom had attracted over 14 million customers (Safaricom, 2009).

Over the years, there have been deregulations in the telecommunications sector in Kenya, which has shifted from a duopoly that was made up of Safaricom and Kencell, to include other mobile telecommunication operators such as Orange Kenya and Yu. When combined, the subscriber base of mobile users in Kenya adds up to 18.5 million (CCK[9], 2009), amongst the national population of 41.07 million (CIA Fact Book/Kenya, 2011). To provide a baseline on the Republic of Kenya, Table 2.1 presents important demographics of the country.

[9] Communications Commission of Kenya

Table 2.1 *Demographics of the Federal Republic of Kenya*

Kenya	
Population	41.07 million
Population age structure	**0-14 years** : 24.3% (Male 8,300,393/Female 8,181,898) **15-64 years**: 55.1% (Male 10,784,119/Female 10,702,999) **65 and Over**: 2.6% (Male 470,218/ Female 563,145)
Illiteracy (persons of age 15 and over that can read and write) levels	Male: 90.6% Female 79.7%
Minimum Wage [Gross Annual Income]	USD 830

Source: CIA World Factbook, 2011.

2.4.2 Mobile Phone Adoption in South Africa

The Republic of South Africa is estimated internationally as the fourth fastest growing global systems mobile (GSM) market (South Africa.info, 2003). Following its inception in 1994, the mobile market in South Africa has matured significantly. Initially, only two operators (Vodacom and MTN) had a market share in this sector, however, recent times have witnessed two new entrants (Cell C and 8ta) in the market.

In the year 2002, the number of cell-phone users in South Africa stood at 13 million subscribers (Cellular Online, 2002), while later statistics acquired in 2007 present a subscriber base of 41.7 million, which accounts for about 85% of the nation's population (Chigona, Beukes, Vally, & Tanner, 2009).

To also provide a general background of the republic of South Africa, Table 2.2 presents vital information on the country's demographics.

Table 2.2 *Demographics of the Republic of South Africa*

South Africa	
Population	49,004, 031
Population age structure	**0-14 years** : 28.5% (Male 6,998,726 /Female 6,959,542) **15-64 years**: 65.8% (Male 16,284,314/Female 15,972,046) **65 and Over**: 5.7% (Male 1,125,709/ Female 1,660,694)
Illiteracy (persons of age 15 and over that can read and write) levels	Male: 86.4% Female 85.7%
Minimum Wage [Gross Annual Income]	USD 2,471

Source: CIA World Factbook, 2011

The proliferation of mobile telephony in both contexts has brought about alternative options for money transfer. This is discussed next.

2.4.3 Money transfer in Africa

There are historical underpinnings attached to the value of mobile money services in Africa, a key one being a medium for money transfer by migrant workers (Sander & Maimbo, 2005). The African continent has a history of colonial rule, and the colonial era was a period where family heads, mostly men, had to migrate from their local communities to the cities to work and earn some income to pay colonial taxes, earn a living for their families, and then send money back to their loved ones (Muwanguzi & Musambira, 2009).

While this was the case in the past, the situation has not changed much for most Africans. Today, the majority of the continent's population still resides in underdeveloped areas (ITU, 2009; World Bank, 2009). About 300 million Africans live on less than a dollar a day and, amongst these, 120 million survive on less than fifty cents a day (Braun, 2007). There are very limited economic activities in these societies. Consequently, the trend continues where the breadwinner has to migrate to urban settlements in order to work, and then transfer funds to their dependents.

To exemplify this, a study by Owour (2004) was carried out on remittances in Kenya, and showed that 35% of individuals in a city called Nakuru indicated that they send money at least once a month to their families in the villages, whereas 41% indicated that they send money home once in two months. Another study was specifically conducted to trace remittances between an unspecified rural and an urban community in Kenya. The results showed that 26% of remittances were rural-to-urban, while 73% was vice-versa (Oucho, 1996). This substantial number of deposits made from the urban areas supports the belief that a significant number of Africans still migrate to work and transfer money back in order to support their dependents at home in the rural areas.

Given this circumstance, it can be said that an affordable money transfer service for this consumer group was a lucrative medium with which to facilitate transactions between migrants and dependents.

2.4.4 The Mobile Money chronicle of Kenya and South Africa

The proliferation of mobile phone adoption in the continent has created channels for new business ventures. A number of organizations have embraced opportunities to provide services to previously unreached consumers in society.

The first mobile money venture targeted at the unbanked in Africa was launched by Wizzit - in 2004, and its target was the 16 million unbanked population in South Africa (Richardson, 2007). The service did not require users to have bank accounts. Given that this service was targeted at this large population size, four years down the line, Wizzit had attracted only an estimated 250,000 customers, which was deemed an unprofitable venture (Ivatury & Mas, 2008).

Following the unsuccessful venture of Wizzit in South Africa, the next mobile money project in Africa was M-pesa. It was initiated by Safaricom and launched in 2007 in Nairobi, Kenya. Contrary to the predicament of its predecessor, M-pesa gained a substantial market share (8.6 million registered users) within two years (Safaricom, 2009). Subsequently, three years later, in 2010, Vodacom implemented the same service (M-pesa) in South Africa. Again, the reception of M-pesa in South Africa has not been commendable. A year after its launch, it has attracted only 140,000 users (Mcleod, 2010; Speckman, 2011).

Thus, a mobile financial service (M-pesa) that leverages the proliferation of mobile telephony to support the needs of consumers in developing country contexts to transact and transfer money has been received with mixed perceptions and varying levels of use. In particular is the strong contrast between the usage levels in Kenya and those within South Africa.

Thus in an effort to understand this occurrence, the following research questions as identified *in chapter one are posed*:

1) What environmental and individual level factors are suggested in the literature as the most *likely* to influence consumer intentions to use M-pesa?

2) To what extent do Kenyan and South African consumers differ in their intentions to use M-pesa and in their perceptions of the individual level factors identified by research question 1?

3) What are the effects of the selected individual level factors on South African consumers' intentions to use M-pesa?

The researcher now turns attention to addressing research question 1- factors suggested in the literature as the most *likely* to influence consumer intention to use M-pesa. The researcher addresses research question 1 in two ways. Firstly, by reflecting on macro-environmental differences in Kenya and South Africa in order to further contextualize the contexts within which M-pesa has been introduced and to explore the potential for environmental factors to impact M-pesa use. Then, the researcher turns attention to understanding usage intentions as behaviour at an individual level. The researcher draws on four theories- TAM, TRA, SCT, and Switching Cost from the consumer and computing behaviour literatures to identify relevant individual level variables that may impact usage intentions.

2.5 Possible external environmental factors affecting M-pesa adoption in Kenya and South Africa

The two countries in question are located on the same continent. However, they stand economically, geographically, and culturally at different points. This section draws on Camner, Sjblom, and Pulver's (2009) paper on factors that could affect the success of mobile money implementation - a comparison between Kenya and Tanzania. In this section, nine external environmental factors that can influence M-pesa usage are drawn from Camner *et al.* (2009):

- infrastructural development
- economic standing
- access to financial services
- prior methods of money transfer
- market share of service providers
- agent network
- advertising
- fee structure
- technology platform.

2.5.1 Infrastructural Development

Several factors contribute to consumer intention to use a technology-based service in various countries. However, a critical one that cuts across national and international borders is a country's level of urbanization (Dekimpe, Parker, & Sarvary, 2000). These authors further mention that there is a general assumption that more densely populated areas in a country equate to a faster use pace of mobile based services. Kenya and South Africa have a similar population size of 41.07million and 49,004,031 million respectively (CIA World Fact Book/ Kenya, 2011; CIA World Fact Book/South Africa, 2011).

Although urbanization in both countries is being promoted by the respective governments, infrastructural development in South Africa is currently ahead of Kenya. However, reports show that Kenya's urbanization rate per annum is estimated at 4%, whilst South Africa's is at 1.4% (CIA World Fact Book/Kenya; CIA World Fact Book/South Africa, 2011). Kenya has only three large cities (Nairobi, Mombasa, and Nakuru), whereas South Africa has over 25 large cities (Cape Town, Johannesburg, Durban, Pretoria, George, East London) amongst others (Butler, 2003). This leaves Kenya with an urban population of 22% and South Africa with 61%. Thus, based on the yardstick noted by Dekimpe *et al.* (2000), use of a mobile-based service should occur at a more rapid pace in South Africa than in Kenya.

Notwithstanding, it is common practice amongst low-income individuals in both countries for the breadwinner to migrate in search of work in the city. In the case of South Africa, the Apartheid-era placed restrictions on the movement and settlements of non-white persons in urban areas until 1994, when the country's governance structure was changed to a democratic system. Thereafter, it would have been expected that there would be more family migrations to urban areas instead of just the breadwinner, as this could have been a more convenient living arrangement. Yet, this is not the case, because the status-quo remains, whereby only breadwinners migrate (Posel & Casale, 2003; 2006). This pattern resonates with the need for a remittance service to facilitate support of migrants' dependents (Mas & Morawcynski, 2009). On this note, and in terms of urbanization, no distinguishing circumstance with respect to urbanization exempts individuals in both countries from opting for an affordable money transfer service.

2.5.2 Economic Standing

A country's economic standing plays an influential role in the successful implementation of a financial service. Thus, to compare the intention to use M-pesa within two countries, both countries economic status must be examined.

South Africa has a more opulent economy and a better banking infrastructure than Kenya - see Table 2.1 and 2.2 (page 22 and 23) for GDP[10] differences. This view, however, is based on infrastructure within the urban areas. On the other hand, rural South Africa seems to have been neglected by banks in terms of access to financial services. A search was conducted by the researcher on the number of South African banks and micro-financial institutions that operated branches in the rural areas. None were found to exist. This situation exists because some South African banks note that the operational costs of running branches in these areas outweigh the revenue that may be generated. A similar search was conducted on Kenyan financial institutions and availability of services in rural areas; it was discovered that a union existed - Kenya Rural Savings and Credit Cooperative Society Union (KERUSSU[11]). On this note, Nair and Kloeppinger-Todd (2007) report that this union has more than 1.2 million members (customers), and savings deposits in excess of $78 million. Furthermore, the

[10] Gross Domestic Product (GDP) is the market value of finished goods and services produced within a country in a specified period.(http://www.investopedia.com/terms/g/gdp.asp)

[11] KERUSSU is a network of rural financial co-operations in Kenya.

membership of financial co-operations in the union is averaged to be about 25,000, which enables these networks to provide a wide range of financial services to rural Kenya.

M-pesa is facilitated by efficient cash flows between banks and the M-pesa agents, which implies that in the absence of one party, operations would be halted. In summary, the value of a union such as this stems from its ability to act as a proxy bank by providing cash deposits to M-pesa agents[12]. Given that South Africa lacks such unions or another enabling infrastructure for M-pesa agents to operate within rural areas, this could be an impeding factor in the use of M-pesa in the country.

2.5.3 Access to financial services

Current statistics on bank account ownership as reported by Payne (2011) reveals that 63% of the adult populations in South Africa have bank accounts, whilst data by Finscope[13](2011) shows that only 22.6% of the adult population in Kenya have bank accounts.

In order to contextualize the impact of access to finance on M-pesa use, an argument by Camner et al (2009) states that a possible reason for the higher use of M-pesa in Kenya than in Tanzania could be that a larger percentage of persons in the former were financially included, making them financially literate and aided in a smooth transition to using M-pesa. In contrast to this view, the South African population has more financially included persons than Kenya; hence the expectation would be that use of M-pesa would be higher in South Africa than in Kenya, as there is a higher level of financial literacy. However, this assumption has not held true in this context.

Another interesting point noted by Camner *et al.* (2009) is that although M-pesa was targeted at the unbanked, the early users of M-pesa in Kenya were made up of mostly the banked population. In essence, use of M-pesa was driven by the banked population. This is probably because potential users need to be financially knowledgeable in order to be convinced about the relative benefits of the service.

[12] Agents in the M-pesa networks are persons who facilitate withdrawals of cash at M-pesa outlets.

[13] http://www.finscope.co.za/new/pages/Initiatives/Countries/Kenya.aspx?randomID=38cee374-d577-4f04-a3ab-ff40cb8bff3c&linkPath=3_1&lID=3_1_3

Finscope is a South African supported study of consumers' and their perceptions on financial products and services.

2.5.4 Prior methods of money transfer

Although M-pesa is now the most popular method of money transfer in Kenya, prior to its existence, other mediums for financial transfers between unbanked individual included: sending money via friends and family, commercial buses, and the post office. Sending money via friends and family was used by 58% of the unbanked (Finaccess, 2007). While these money transfer methods were used, consumers complained about the risks and trust issues involved in using them, but were, nonetheless, constrained to these options (Moracyznski, 2008). Thus, it could be that when a licensed affordable option (M-pesa) was made available to this consumer group, they quickly adopted it.

On the other hand, while similar money transfer mediums (e.g. transfer via friends and family) are still being used by low-income individuals in South Africa, recent initiatives subsequent to Wizzit but prior to M-pesa do exist. One of such service is called 'Shoprite money'[14]. Although there is no current statistic on the number of users of existing alternatives to M-pesa, a report by Deloitte (2010) suggests that consumer use rates are reasonable.

To this end, it could be put forward that, like the case in Kenya where individuals embraced the first available and affordable financial service offered to them, South African consumers have available to them a broad range of options for money transfer services. Thus, prior existing methods of money transfer which consumers are already comfortable with could impede their intention to use a newer, similar service.

2.5.5 Market Share of service providers - *Safaricom and Vodacom*

Safaricom and Vodacom both hold the largest market share in the mobile telecommunication sector in Kenya and South Africa, with market shares of 69.9% and 48%, respectively (Nyabiage, 2011; Maharaj, 2010). Given that these M-pesa service providers dominate their market in each nation, it is logical to expect this advantage to play in their favour. However, as it stands, it seemed to have played favourable in just one nation.

This could result from alignment issues between the M-pesa service provider and its current consumer group. In essence, majority of the low-income population within Kenya may have been subscribers to Safaricom, while in South Africa; the majority of this consumer group

[14] A money transfer service initiated by a large retail store in South Africa in conjunction with a local bank that allows individuals to send and receive money to persons in the country, at a standard fee of R9.99.

may not be Vodacom customers. Thus, consumers on a different network who intend to use the M-pesa service might have to deal with a switching cost.

2.5.6 Agent Network

The M-pesa service is based on a branchless banking model which was designed to reach the previously unbanked population. In Kenya, to facilitate deposits and withdrawals, previous Safaricom airtime[15] retailers were recruited as M-pesa agents to register customers, and to enlighten them concerning how to use the service (Camner *et al.* 2009). In essence, M-pesa agent networks were built on existing airtime distribution channels which were accessible in low-income communities.

In South Africa, the agent network model adopted a similar approach where agents include: Vodacom stores, pep stores[16], spaza[17] shops, community containers, selected retailers, and all Nedbank branches. While the agent network recruitment approach has been employed by both countries, it is unclear why the approach worked in only one context.

2.5.7 Advertising

In Kenya, Safaricom used the phrase 'Send money home' as the slogan for promoting the M-pesa service (Camner *et al.* 2009). The point to note here is that this slogan is vague, as it doesn't speak to a specific group, within the predominant four racial categories [18]represented in Kenya. However, it does capture the concept of remittances at a large scale, hence including any consumer group.

Vodacom in South Africa had no notable slogan for M-pesa, and they used a racial theme to capture the target group. Their visual depiction of the service implied the black population as the target; where their billboard shows a black man in the city sending money to his mother in a rural community. Given that South Africa is made up of persons of different races, and that the majority of the population is of black race and make up the vast population of low-income citizens, this message could have stigmatized M-pesa and created perceptions within

[15] Airtime refers to cards provided by mobile network operators that have a secret pin number which an individual loads onto his or her cell phone to give credit against which they can make calls and send messages.

[16] Pep is a multinational retail company in South Africa

[17] Spazas are informal convenience shops in South Africa, and they are usually run from private residences.

[18] The four predominant racial groups represented in Kenya are Blacks, Arabs, Indians, and Europeans.

the population that M-pesa is intended for unemployed, less educated, and dependent individuals in low-income communities.

In a nutshell, while M-pesa is targeted at the unbanked population, these individuals alone do not have the financial capacity to drive a sustained need for the service. Thus, existing advertisements that focus on a single population group as opposed to a more general public may be a factor impeding use of M-pesa in South Africa.

2.5.8 Fee Structure

The fee structure for M-pesa in both countries is similar because there are transaction ranges and fixed fees for various transaction categories. However, in South Africa, there are two categories of customers (standard and premium). The latter have privileges of sending larger sums of money in comparison to the former. In Kenya, however, there is no distinction amongst users. The difference in fee structure between these countries could be a possible cause for the differences in consumer use of M-pesa.

The M-pesa fee structure could have been accepted without much contemplation by Kenyans because it was the first affordable financial service for the unbanked consumer group. Hence, consumers could have based their use on its relative affordability in comparison to the already available services which cost much more and contains risks.

In contrast, given that, in South Africa, there were at least two money transfer services targeted at the unbanked population prior to the launch of M-pesa (Wizzit and Shoprite money), and that one of these services uses a fee structure that is relatively cheap and standard across all transaction ranges, this could have negatively impacted South African consumers intention to use the more complexly structured M-pesa.

2.5.9 Technology Platform

GSM money transfer is operated using one of two protocols; the STK and USSD[19]. The M-pesa service in Kenya uses STK, whereas USSD is used in South Africa. The difference between these two protocols is that STK is embedded in the Subscriber Identity Module (SIM) card, allowing for menu driven services. Conversely, with USSD, the user accesses

[19] SIM Application tool Kit (STK) and Unstructured Supplementary Service Data (USSD) are protocols used by GSM devices to initiate communication with the service provider and other users on the network (see Appendix D1 and 2 for the different interfaces.

services by dialling a number that begins with an asterisk (star) or the gate (hash) character. The request for a particular service then prompts a menu response. This process proceeds on a back and forth basis, which could be both time consuming and complicated. The differences in ease of use could be influencing intention to use within these countries. Accessibility of M-pesa functionalities is thus much quicker using the STK protocol, and the more complicated process in South Africa may have negatively impacted consumer usage intentions.

2.5.10 Summary

This section has highlighted possible external and environmental factors that could influence consumer intention to use M-pesa. The themes captured in relation to external factors will be referred to later on in the light of some empirical evidence.

Looking at these external environmental factors, there are a number of common inconsistencies. While these factors provide us with greater insights into the broader context of M-pesa use, they raise further questions and also point to the need to explore usage with reference to individual level perceptions.

For example, M-pesa service providers in both Kenya and South Africa have the largest market share in the mobile telecommunications sector. This advantage of the M-pesa service providers in both countries has only played favourable in one context.

Thus for reasons such as this, to make greater sense of our understanding of M-pesa usage, the researcher turns attention to focus on the individual level factors that may explain use.

Table 2.3 *Summary of identified differences between the countries of focus for this study*

Observed differences between Kenya and South Africa	
1. Infrastructural Development	Development is occurring at a reasonable pace in both countries, and low-income individuals' in both countries require an affordable money transfer service.
2. Economic Standing	South Africa has a better banking infrastructure than Kenya. However, their services are only evident in the urban areas. On the other hand, Kenya has KERUSSU which serves individuals' in low-income areas of the country.
3. Access to Financial Services	Access to financial services for low-income individuals' is greater in South Africa than in Kenya.
4. Prior Methods of Money Transfer	Affordable money transfer services were available to South Africans prior to the launch of M-pesa. Whereas, M-pesa was the first affordable money transfer service in Kenya.
5. Market Share of Service Providers	M-pesa service providers in Kenya and South Africa lead their market.
6. Agent Network	M-pesa service providers in Kenya and South Africa use a similar agent network model.
7. Advertising	The M-pesa vendors in Kenya advertised the service to a more diverse consumer group than the M-pesa vendors in South Africa.
8. Fee Structure	There is no service fee distinction amongst M-pesa users in Kenya, while there is in South Africa.
9. Technology Platform	The GSM money transfer protocol (STK) used in Kenya is less complicated to use than the one (USSD) used in South Africa.

2.6 The need to explain consumer use of technology in Africa at the individual level.

Efforts by academics towards understanding technology use in Africa have not usually been considered a worthwhile venture, because on a diffusion scale, the majority of individuals in this part of the world are considered laggards[20]. This perception has possibly been due to the deprived economic conditions of the majority of people residing within the African continent. Therefore, a focus on understanding consumer intentions to use technologies in the developed world was considered more meaningful.

In accordance, Leading developing-country researchers - Walsham, Robey, and Sahay (2007) - suggest that the lack of effort on IS research in developing countries may be attributed to debates on whether or not ICT was relevant to these countries; a question which has been answered in the affirmative. The focus therefore should not be on whether but rather on how ICT can be used and applied to enhancing the developing parts of the world (Walsham *et al.* 2007).

Research on the use of technology-based products in developing countries is now based on the assumption that ICTs are relevant in these nations.

The mobile phone is one technology-based product that has penetrated developing countries, especially in Africa. This prompted Greengard's (2008) position that only a few technological innovations have impacted the world today as rapidly as the mobile phone. Given that the mobile phone is a personal device, earlier studies (Odedra-Straub, 1996; Bhatnagar & Odedra, 1992; Avgerou & Walsham, 2000; Krishna & Madon, 2003; Molla & Licker, 2005) on technology use in developing countries looked at technology use in an organizational context. This perspective does not aid much in understanding the individual's intention to use in a non-work related environment. Notwithstanding, recent times have seen a re-direction of the literature, now focusing on individual consumer intentions to use technology-based products and services in these parts of the world.

In the past, the use of technology-based products in Africa has not always been choice-based because access was available to only a few segments of the population, more specifically about 30% of the population (Musa, 2006). Moreover, the use of a technology-based product

[20] Laggards refer to individuals that are last to adopt a product. This is one of the adopter categories in the Innovations Diffusion Theory that was posited by Rogers (1995).

in Africa may have been restricted to wealthier individuals (Jensen, 2001: Mbarika, Musa, Byrd, & McMullen, 2002). However, because of the proliferation of mobile phone use on the continent, there is an increased need to examine usage intentions. Although these efforts might be hampered by lack of theory specific to developing country context, there is nonetheless some progress being made and this is discussed next.

2.7 Prior empirical research into mobile technology adoption within developing countries.

According to Donner (2008), a broad categorization of the existing studies in this space (mobile technology use in developing countries) can be grouped into three dimensions. The first dimension focuses on *mobile adoption* amongst consumers; the second examines the *impact* of mobile technology on consumers and society; the third assesses the *inter-relationships* between mobile users and the technology itself. Past research in mobile technology use are discussed in this section, with a focus of on the first two [21]of these areas that are important to informing this study.

2.7.1 Adoption Studies

Some adoption studies (e.g.: Brown, Cajee, Davies, Stroebel, 2003; Rogers, 2003; Kini & Thanarithporn, 2004; Meso, Musa, & Mbarika, 2005) have often focused on the astounding rates of mobile diffusion in developing parts of the world, while others (Hamilton, 2003; Esselaar & Stork, 2005; Hodge, 2005; Garbacz & Thompson, 2007) have examined the regulatory structures that promote or inhibit mobile adoption. A number of the former studies have tackled the issue of adoption from a diffusion[22] perspective postulated by Rogers (1995), because this is a common premise in consumer adoption of technology research (Orlikowski & Iacono, 2001). This perspective has been employed in various contexts such as adoption of mobile banking in South Africa by Brown *et al.* (2003), adoption of mobile commerce in Thailand by Kini & Thanarithporn (2004), and Mobile adoption in Nigeria by Meso *et al.* (2005). Alternatively, a large number of positivist studies carried out in this area have used the TAM in predicting mobile adoption in South Africa (Van Biljon & Kotze, 2007), in Kenya (Mbogo, 2010), and in Nigeria (Meso *et al.* 2005; Musa, 2006).

[21] The third focuses on how technology is changing communication patterns (e.g., Donner, 2007; Tall, 2004; Kamga, 2006; Molony, 2006).

[22] Innovation Diffusion Theory (IDT) refers to a theory that aims to explain how an innovation is communicated via various channels over the years amongst persons in society.

Another popular theory which has been used in exploring mobile adoption in developing countries is the TRA [23](Fishbein & Ajzen, 1975). It has been applied in several studies (Kaba, Diallo, Plaisent, Bernard, & N'Da, 2006, Adeoti & Adetola, 2006, Scott, McKemyey & Batchelor, 2004) which have examined mobile adoption in various African countries such as Botswana, Guinea, Ghana, Nigeria, and Uganda.

In general, adoption studies in developing countries attempt to identify possible factors that influence mobile diffusion amongst residents in this region. While different factors have been employed in various contexts, a common finding by all these studies is that the usefulness of the mobile phones for different tasks is a prominent reason for adoption in these countries.

2.7.2 Impact Studies

These studies assess the mobile phone's contribution towards the advancement of developing countries, and are usually affiliated with ICT4D[24] assessments (Sridhar & Sridhar, 2006). Furthermore, impact studies draw on the influence of telecommunications on economic development (Norton, 1992; Saunders, Warford, & Wellenieus, 1994; Gruber & Koutroumpis, 2011). A number of studies have examined and highlighted the various contributions that the mobile phone brings to individuals in a developing economy. For example, Goodman's (2007) paper examined the link between mobile phone usage and "social capital" in rural South Africa and Tanzania. Goodman used the concept of social capital as a lens for examining the social impacts of mobile phones, and theoretically linked the local social impacts with a broader scope of socio-economic changes. His findings show that access to mobile phones and frequency of use was high in both communities. However, he noted that, most people shared mobile phones, which implied that the mobile phone, besides being a communication device, was also a social amenity that created a community environment. In addition to social capital, mobile technology can be a tool for economic empowerment of individuals.

To highlight a more topic-specific example, the impact of mobile money (M-pesa) is discussed next using an example from local communities in Kenya.

[23] The Theory of Reason Action (TRA) is one used to predict behavioural intention along the lines of attitude.

[24] Information communication technology for development (ICT4D) is a general term used for the application of ICT for socio-economic development.

M-pesa as an empowerment tool

A study which has been conducted specifically on the impacts of M-pesa in various local communities is by Plyler, Haas, and Nagarajan (2010) on the effects of M-pesa at a community level in Kenya. It highlights 11 impacts that the M-pesa service has made in some communities. To name a few: Increased consumer purchasing power, food availability, expansion of businesses, employment opportunities, financial capital security, and physical security.

In terms of increased consumer purchasing power, community vendors in the surveyed local communities reported that since the introduction of M-pesa, their customer base has increased significantly. This is because prior to the launch of M-pesa, individuals living in these communities had limited access cash, as they lacked a medium through which they could receive cash from their breadwinners, who mostly reside in the urban areas. However, since the introduction of M-pesa, they now have readily available access to funds, and are therefore spending it within the local community as opposed to travelling to the urban areas. Thus, M-pesa is stimulating cash circulation within the communities.

Food availability is also credited to the availability of M-pesa. Vendors in local these communities' note that at present they can place orders for goods using M-pesa, and that this saves them the expenses on transportation, which in turn enables them to order a wider variety of goods with the saved funds.

These two examples reveal some of the impacts that the mobile phone has in developing nations.

Ultimately, the contributions of these *impact* studies provide us with insights that span a wide range of anecdotes on how technology is improving the socio-economy of developing countries.

Given that past empirical work has largely associated mobile technology use with positive outcomes such as: its contribution towards increasing social capital in South Africa and Tanzania (Goodman, 2005), attracting new customers and developing business networks (Donner, 2006), and responding to emergencies within and outside a medical environment (Idowu, Ogunbodede, & Idowu, 2003), amongst others. It becomes even more important to understand how to promote technology usage and to understand why variations in use occur.

The next section outlines a handful of studies that have attempted to understand the use of (M-pesa) mobile technology service.

2.7.3 Existing Academic Studies on use and impacts of M-pesa

M-pesa service has been in existence for a little over four years, and while there have been a few attempts to understand the phenomena of the vast use of this service in Africa, the majority of the studies are non-academic studies, and have taken a case study approach.

Table 2.4 presents the few existing studies that have focused on use of M-pesa.

Table 2.4 *Academic published literature on M-pesa*

Academic literature on M-pesa			
Authors	Title of Article	Methodology Employed	Theoretical Framework
Mbogo, 2010	The Impact of Mobile Payments on the Success and Growth of Micro-Business: The Case of M-pesa in Kenya	Quantitative techniques	TAM and additional factors
Moraczynski, 2009	Exploring the usage and impact of "transformational" mobile financial services: the case of M-PESA in Kenya.	Qualitative	Not referenced
Ngugi, Pelowski, & Ogembo, 2010	M-pesa: A case Study of the Critical Early Adopters' Role in the Rapid Adoption of Mobile Money Banking in Kenya.	Qualitative	Not referenced
Tobbin & Kuwornu, 2011	Adoption of Mobile Money Transfer Technology: Structural Equation Modelling Approach	Quantitative	TAM and Diffusion of Innovation Theory.

As can be seen in Table 2.4, only four academic studies are available on the M-pesa phenomenon. However, there are several non-academic papers on the issue. As a result, the current study aims to contribute to the existing body of academic knowledge on the subject.

2.7.4 Summary of existing research

Based on the above streams of available research, the current study aligns itself to the use of mobile technology by individuals and aims to uncover the various factors that predict consumer intentions to use M-pesa. As outlined above (section 2.7.3), the approaches which have been employed by most positivist studies in this area have used diffusion models, TAM models, or TRA models. In light of this, the two available quantitative studies on M-pesa also employed some of these predominant theories – TAM and IDT models in their investigations. While both studies findings aid in framing this study, the current study will also consider additional consumer behaviour perspectives to inform the selection of factors (research

question 1), to facilitate the comparisons of Kenyan and South African consumers (research question 2), and for the development of a model focused on predicting usage at the level of individual users (research question 3). This model and its theoretical underpinnings are discussed next.

2.8 Theoretical Underpinnings of the Research Model

The theory and model being developed in this section aims to account for differences in use of M-pesa at the individual level.

In ensuring an adequate selection of theories in addressing this study's query, a thorough review of the IS literature was imperative. In this vein, the researcher narrowed down the scope to focus on studies that address the relationship between consumer beliefs of a technology-based service, their attitudes towards it, and consequent use-behaviour.

IS research - more specifically, research on technology use - has been examined from various angles, ranging from task-technology fit to implementation success at organizational levels. Nevertheless, the most rigorous studies that have been carried out on individuals' acceptance of technology-based products have approached the issue by predicting intention to use (Venkatesh, Morris, Davis, & Davis, 2003).

There are eight predominant models [25]and theories used in explaining individuals' acceptance of any technology-based service in the IS literature (Venkatesh *et al.* 2003). Amongst these models, the TAM by Davis (1989) and Davis, Bagozzi, and Warshaw (1989) was found to be the most widely used model in predicting consumer intention to use a technology-based product. These two papers have been cited in excess of a thousand times (Brown, Venkatesh, Kuruzovich, & Massey, 2008 p.5).

While the TAM asserts that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the key factors influencing an Individual's intention to use a technology-based service, several scholars (Mathieson, Peacock, & Chin, 2001; Gallivan, 2001) have criticized the model and hold that there are several factors which influence PU, and that these factors, while similar could, still vary across countries (Musa, 2006). In light of this, appropriate

[25] Theory of Planned Behaviour (TPB); Innovation Diffusion Theory (IDT); Social Cognitive Theory (SCT); Model of PC Utilization (MCPU); Combined TAM and TPB (C-TAM-TPB); Motivational Model (MM); Theory of Reasoned Action (TRA); and Technology Acceptance Model (TAM).

factors will need to be adopted from other theories and used to supplement the possible limitations of the TAM in predicting consumer intention to use M-pesa.

Thus, what other theories can be used to supplement the short-comings of the TAM as a basis for explaining consumer intention to use mobile services in an African context?

Mindful of the fact that the current study is an exploratory one in a developing country research space, very few prior related empirical studies were found to exist. A review of several relevant fields has therefore been integrated to address the study's query. The researcher postulates that to fully address the study's research questions, theories from consumer behaviour and computing behaviour will need to be integrated. To identify the factors from each of these theories constitutes the answer to research question 1. These factors will later be compared across the two contexts to answer research question 2, and later on examined in the South African context to answer research question 3. These theories are considered next.

2.8.1 Technology Acceptance Model (TAM)

The TAM as posited by Davis (1989) is one that has been widely instrumental in the prediction of individuals' behavioural intention to use a technology-based product. It puts forward that an individual's intention to use is predominantly based on two beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) of a technology-based product.

PU and PEOU are treated as determinants of intention to use in a manner consistent with studies by developing-country researchers (e.g. Meso, Musa, & Mbarika, 2005; Musa, 2006; Mbogo, 2010; and Tobbin & Kuwornu, 2011).

2.8.1.1 Perceived Usefulness

Perceived usefulness is defined as "the degree to which a person believes that a particular system would enhance his or her job performance." This is the most prominent belief in TAM, and explains that a user's perception about latent benefits of using a technology-based product elicits positive feelings towards it (Davis, 1989; Davis et al, 1989). Some of the noted latent benefits for a user in the literature are the reduction of time and effort to complete a task, better control during interaction with the system, and greater expediency. Hence PU has been positively linked to attaining a value goal.

A proxy for the PU construct is the 'performance expectancy' construct in the Unified Theory of Technology Acceptance and Use of Technology (UTAUT) model, posited by (Venkatesh *et al.* 2003). This model was developed based on an encapsulation of key predictor variables in predominant models. The authors set out to empirically compare predominant models and theories in an effort to create a parsimonious model that predicts direct determinants of usage or intention. Like PU, performance expectancy constructs have been found to be the strongest predictor of intention to use a technology-based product (Venkatesh *et al.* 2003).

Thus, constructs that have direct connotations to Usefulness have been used extensively in IS research, and there is empirical evidence to show the strong predictive power of these constructs in accounting for consumer adoption of a technology-based product (Mathieson, 1991; Szajna, 1996).

2.8.1.2 Perceived Ease of Use

PEOU is the extent to which a person believes that a technology product requires little or no effort to use (Davis, 1989). PEOU is the other dominant variable in the TAM. An individual would opt for a product from a range of available options if it requires little or no effort to use (Davis, 1989). Over the years, several studies (e.g.: Davis *et al.* 1989; Agarwal & Prasad, 1997; Jackson, Chow, & Leitch, 1997; Venkatesh & Morris, 2000) have produced results that show the significant effect of perceived ease of use either impacting intention to use directly or indirectly.

Since the proposal of the TAM, subsequent empirical studies (Agarwal & Karahanna, 2000; Karahanna, Agarwal, & Angst, 2006; Venkatesh *et al.* 2003; Venkatesh, Davis, & Morris, 2007) in this field have strongly supported the position of the model. In light of this, the TAM is deemed to repeatedly account for up to 40% of the variance in individual's intention to use a technology-based product (Venkatesh & Davis, 2000; Venkatesh *et al.* 2003; Legris, Ingham, & Collerette, 2003; Yang, 2005; Schepers & Wetzels, 2007). On this note, the two topic-specific empirical studies which employed the TAM found that its variables accounted for a significant percentage of the variance on intentions to use.

Drawing on findings from a closely related study - adoption of mobile banking – Wang, Wang, Wang, Lin, & Tang (2003) suggest that to ensure a situation where a system is fully utilized, mobile-based products should be easy to learn and use. This implies that even though a technology-based product is deemed useful, if it is difficult to use, consumers will refrain from using it.

A number of studies have investigated the impact of PEOU in mobile technology use: Lu, Yu, Liu, and Yao (2003) examined consumer intention to use wireless internet, Luarn & Lin, (2005); Wang & Lin, (2005); Kurnia, Smith, & Lee (2006); Mallat, Rossi, Tuunainen, & Oorni (2006); and Wang & Barnes (2007) assessed intention to use M-commerce applications. Liao, Tsou, Huang (2007) looked at intention to use 3G[26]services. Guriting & Ndubisi (2006) studied intention to use online banking services.

A uniform finding in the above-mentioned studies is that PEOU influences a consumer's intention to use. However, an interesting position taken by Rogers (1995) is that consumers perception of the complexity of a technological product could inhibit their intention to use similar technology-based products.

Hence, PU and PEOU from the TAM should aid in the explanation of a reasonable percentage of the variance in understanding consumer intention to use M-pesa, and are adopted for this study. Additional factors are discussed next.

2.8.1.3 Extended TAM

Social psychology perspectives

The TAM is an adaptation of the TRA[27]and the Theory of Planned Behaviour (TPB[28]), which posits that attitude and subjective norm influence behavioural intention. The proposal of the TAM was an early endeavour to examine the effects of psychological factors on consumer intention to use, and its ultimate proposition was that PU and PEOU are the key influential factors which impact an individual's attitude to use a technology-based product (Schepers & Wetzels, 2007). Hence, the original TAM did not include subjective norms. However, a social psychological perspective advocates that the social contexts could alter an individual's perception towards an idea (Robertson, 1989, p172). In this vein, Venkastesh and Davis (2000) propose in TAM2 that subjective norm impacts PU and intention to use, and they empirically tested the relationship, finding it to be significant.

[26] 3G- Third generation mobile telecommunication.

[27] TRA is one that is used in predicting consumer behavioural intention, more specifically it examines the link between attitudes and behavioural intention.

[28] TPB is an extension of TRA. It posits that personal attitudes, perceived behavioural control, and subjective norm influence an individual's behavioural intention.

2.8.1.3.1 Subjective Norm

Subjective Norm (SN) refers to an individual's belief that the majority of the people whose opinions matter to them are of the view that they should engage in certain behaviour (Fishbein & Ajzen, 1975). SN is a core variable within the TRA where it is hypothesized to influence behavioural intention because opinions of others within a social context are likely to influence an individual's decision to perform a certain action (Miller, 2005).

There are several studies that have modified the TAM to include the subjective norm perspective; however, the construct has had a varied and questionable role in determining technology use (Schepers & Wetzel, 2007). While some studies (e.g.: Igbaria, Zinatelli, Cragg & Cavaye, 1997; Cheung, Lee, & Chen, 2002; Riemenschneider, Harrison, & Mykytn, 2003) found subjective norm to considerably impact a criterion variable, others (e.g.: Lau, Yen, & Chau, 2001; Roberts & Henderson, 2000) did not find a significant effect. This pattern could suggest that its applicability is contextual based.

2.8.1.3.2 Self- Efficacy

The self-efficacy construct also has roots in social psychology, and affiliated fields. More specifically, it is from the SCT[29]. Alfred Bandura a leading researcher in this space defines self-efficacy as the way in which people think, feel, or inspire themselves (Bandura, 1982; Bandura, 1994). In essence, self-efficacy is an individual's conviction in his capabilities to arrange and perform a given course of action necessary to manage a likely situation. An individual's self-conviction in getting through difficulty is the basis of the construct. Persons who lack self-confidence are more likely to relent when faced with challenges. Bandura's (1994) position on this variable has been employed in IS literature and contextualized as an individual's belief that he can perform a target behaviour (Compeau & Higgins, 1995).

There are debates as to the path effect of self-efficacy on intention to use a technology-based product. Some studies have shown that self-efficacy is a direct predictor of behaviour (McKee, Simmers, & Licata, 2006), while others have proposed a mediating effect (Brown, 2002; Venkatesh, 2000). Thus, when applied in the IS domain, computer self-efficacy (CSE) has proven to be applicable on a case-to-case basis, and should not be generalized (McKee *et al.* 2006; Marakas, Johnson, & Clay, 2007). For example, an individual's self-efficacy with mobile phones may not apply to laptops.

[29] SCT posits that the knowledge acquisition process is directly influenced by our observation of others within social contexts.

Based on arguments in section 2.8.1.3.1 and 2.8.1.3.2, both SN and SE are included as factors in this study. While the above factors from social psychology theories will provide insight on the influence of consumer and computing behaviours on an individual's intention to use, it is also important to consider additional factors from consumer behaviour theories. In particular, this study explores the theory of switching costs.

2.8.2 Consumer Behaviour and Theory of Switching Costs

Switching cost as defined by Jones, Mothersbaugh, & Beatty (2002) is the economic and psychological cost that an individual faces in making a decision to change from one alternative product/service to another. In essence, switching cost could be viewed as barriers which restrain customers from opting out of their current service.

M-pesa is a relatively new product in the African market and, while the service is deemed to fill a gap in the market, the target consumers of this service could have alternative mediums for making their financial transactions. As a result, the relevance and application of switching cost dimensions are required because they will help in unpacking the various costs that impede an individual's intention to use M-pesa.

Switching costs are critical factors which influence individuals' decisions in opting for a new service, so it is interesting to note that very few studies exist on the measurements of switching costs and their role in influencing use of a technology-based product (Whitten & Wakefield, 2006).

Switching cost comes in different spectrums. Several scholars have voiced their opinion on different areas where switching cost applies. Weiss and Anderson (1992) propose that, in a buyer-seller relationship, switching cost can be seen as the overall cost or difficulty in switching. Similarly, Ping (1993) views it as the extra cost in effort to change suppliers, and Morgan and Hunt (1994) propose that it is an undefined component of terminating an existing service relationship.

When dealing with service relationships, switching costs capture perceptions of time, effort, and money in shifting from one service provider to another (Jones *et al.* 2002). In accordance, Chen and Hitt (2002) label it an individual's perceived disutility, and Burnham, Frels, and Mahajan (2003) term it as one-time costs involved in switching service providers. Ultimately,

the literature captures switching cost as economic and relational resources in switching from one service provider to another.

2.8.2.1 Dimensions of switching costs

In order to unpack the distinct components of switching costs, most available literature on the issue has concentrated on the economic and relational dimensions. Following this trend, Jones *et al.* (2002) – was in a study that examined the impact of switching cost in the banking and hairstyle industry. The authors note that, in switching from one service provider to another, customers grapple with various costs. These costs vary from time utilized to acquire necessary information in order to use a service, to the loss of benefits due to termination of an existing relationship with a service provider.

While there is some consensus in the literature on the definition of switching costs, its elements are still vague (Caruana, 2003). This could be attributed to its presence in several academic disciplines such as marketing, economics, and strategy, amongst others, which makes it difficult for a specific application. Another point to note is that switching cost dimensions are not tied to any one theory but, rather, their dimensions seem to have a role in several theories across disciplines. Context specific applications would therefore help provide frameworks in understanding the role of switching costs, their dimensions, and their relevance in explaining a given phenomenon.

Given that the Jones *et al.* (2002) study was carried out in two contexts - one being the banking industry, which is closely related to this study's context the dimensions employed in their study was adopted for this study because they were able to empirically measure and validate these dimensions as distinct switching costs. Thus, their study can be viewed as a platform on which this study aims to build on.

In order to provide perspective on the application of switching cost theory, Table 2.5 presents a list of some existing work that have applied switching costs in their investigations.

Table 2.5 *Synthesis of prior work on switching costs and the service industry*

Authors and year of Publication	Switching Cost Dimensions	Sample context	Theoretical framework	Findings
De Ruyter, Wetzels, & Bloemer, (1998).	Time, Effort, and Money	High Switching Cost Services: Health Centres, Theatres Low switching cost services : Supermarkets, and recreational facilities	Channel Relationship Theory	For services with low switching cost, consumers are unbiased as to preference and price differences as opposed to high switching cost sectors.
Sharma & Patterson, (2000).	Monetary cost and psychological barriers	Finance services	Channel Relationship Theory	Satisfaction and Trust variables are moderated by switching cost.
Jones, Mothersbaugh, & Beatty, (2000).	An encapsulated measure of Effort, Time, and Money	Banks and Hairstylists	Cost-Benefit and relationship framework	Switching Cost has a moderating effect on a consumer's satisfaction and their intention to switch service providers.
Jones *et al.* (2002).	Uncertainty Costs, Pre-Switching Search and Evaluation Cost, Cost of Lost Performance, Setup Cost, Sunk Cost, and Post-Switching Behavioural and Cognitive Cost	Hair stylists and Banks	Cost-Benefit and relationship framework.	All six switching cost dimensions positively correlate to consumers' repurchase intentions.
Burnham, Frels, & Mahajan, (2003).	Monetary Loss Cost, Brand Relationship Loss Cost, Learning Cost, Economic Cost, Evaluation Cost, Benefit Loss Cost, Personal Relationship Cost.	Payment Cards	Undefined	Switching cost influences consumer intention to transact with their current service provider
Whitten and Wakefield, (2006).	Uncertainty Cost, Setup Cost, System Upgrade Cost, Sunk Costs, Hiring and Retraining Cost, Lost Benefits Cost, Search and Evaluation Costs.	IT Outsourcing	Social Exchange Theory and Transaction Cost Theory.	No causal effects tested.

2.9 Research Model

In view of the assessment of the literature, this section constructs the following model as a means to determine consumer intention to use M-pesa. The research model is depicted in fig 2.1.

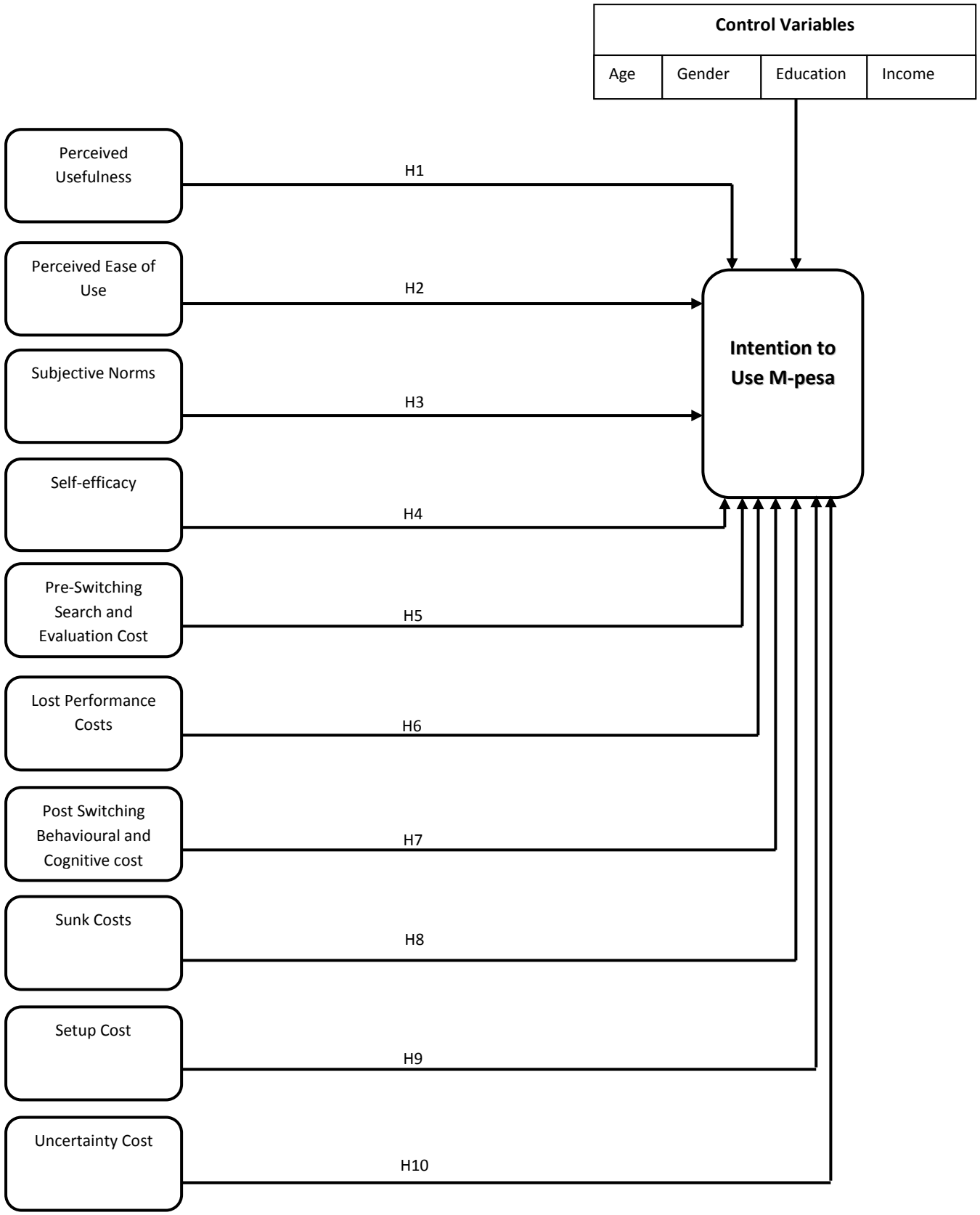
The ten factors depicted on the left hand side of the model in figure 2.1 provide answer to research question 1. At a later stage in this study, these factors will be examined across Kenyan and South African consumers to provide an answer to research question 2.

The next section hypothesizes their effects on usage intentions (intentions to use) to provide a basis for tackling research question 3.

2.9.1 Research Model for Research Question 3.

The research model draws on TAM, TRA, SCT, and Switching Cost theory models.

Figure 2.1- *Research Model*



2.9.2 Dependent Variable

The following variable has been selected as the criterion variable for this study. Justification for its selection will be discussed next.

2.9.2.1 Intention to Use

Intention to use in this study refers to an individual's self-reported probability of using the M-pesa service when transacting, as well as the individual's preference for the use of M-pesa over other services/methods for transacting. Over the years, consumer behaviour has been a topic of interest in behavioural sciences. Behavioural beliefs relate to a consumer's positive or negative assessment of performing a particular behaviour (Ajzen & Fishbein, 1980).

The intention to use variable is rooted in the widely accepted TAM that draws on the TRA and TPB frameworks, and was developed to guide IT acceptance in research and practice. A central theme supported by empirical evidence amongst these theories is that changes in beliefs have direct influences on intentions. While all three theories are instrumental in predicting consumer intention to use, amongst them, the TAM has gained the most acceptances in the literature, and is often used in studies which examine consumer use. More specifically, its area of strength is in situations where individual differences and social influence are assessed (Venkatesh & Morris, 2000). The intention to use variable in the TAM has thus been deemed suitable for studies that seek to understand consumer intention to use a technology-based service in the early stages of its diffusion (Hong & Tam, 2006). Given that the present study aims to predict consumer intention to use M-pesa, which is still running its course in the stages of diffusion, and to compare consumer perceptions that include individual differences and social influential factors across two countries, the intention to use variable was opted for.

2.9.3 Independent Variables and Proposed Hypotheses

The variables discussed in the subsequent section have been selected based on a thorough review of the literature and will be presented next. Possible relationships between the independent variables and the dependent variable are also posited.

2.9.3.1 Perceived Usefulness

In the context of this study, PU from TAM refers to a consumer's task performance, where the task is the use of M-pesa, and reflects the need for a consumer to engage in the use of M-pesa for external rewards.

M-pesa is a product that enables consumers to accomplish personal financial transaction goals such as affording them a cheaper medium to send and receive money from wherever they are, and reduces the time it takes them to send and receive money. These are the external rewards that constitute the basis around which perceptions of M-pesa's usefulness are formed. According to Venkatesh *et al.* (2003), Compeau & Higgins (1995), and Plouffe, Hulland, & Vandenbosch's (2001), intentions to use a technology-based product are influenced by perceptions of the external rewards and its potential to improve task performance.

Therefore, as with similar studies (Tobbin & Kuwornu, 2011; Mbogo, 2010), it is hypothesized that the greater a consumer's perception of M-pesa's usefulness, the more likely they are to use M-pesa. Consumers who perceive M-pesa as useful for improving task performance are more likely to use the service.

Hence this study's first hypothesis:

H1- Perceived Usefulness of M-pesa will have a positive effect on an individual consumer's intention to use.

2.9.3.2 Perceived Ease of Use

PEOU, also from the TAM refers to an individual's perception of lack of mental effort required in using M-pesa (Davis, 1989). This is a pivotal behavioural belief influencing consumer intention to use a technology-based product or service. This construct is believed to influence consumer intention to use directly or indirectly through perceived usefulness. This assumption is based on varied results of the impact of the construct across contexts (Subramanian, 1994; Lucas & Spitler, 1999).

A couple of empirical studies (Warren, 2002; Lowry, 2002; Henderson & Divett, 2003) have tested the impact of PEOU as a predominant influencer of a consumer's intention to use. While some studies (Lowry, 2002) confirmed the impact of PEOU on consumer intention to use, others found it had a mediating effect (Henderson & Divett, 2003).

A suggestion by some scholars (Venkatesh & Bala, 2008; Karahanna, Straub, & Chervany, 1999; Hernandez, Jimenez, & Martin, 2008) is that in the early stages of adoption, PEOU more than PU, is a stronger determinant of usage behaviour. The reason being that consumers

are first concerned with the ease of use of the product, and after they familiarize themselves with its use, the need for benefits comes into play.

For this study, given the diffusion rates of mobile phones in Africa and that M-pesa operates on this platform, it is posited that consumers in this part of the world would perceive M-pesa as easy to use.

Hence the second hypothesis:

H2- Perceived ease of use of M-pesa will have a positive effect on an individual consumer's intention to use.

2.9.3.3 Subjective Norms

Although there is a lack of consensus on the effect of the subjective norm variable on technology use, there is a logical postulation for a relationship between it and a user's intention to use. An individual will be more likely to use M-pesa if the people whose opinions they value deem the use of M-pesa worthwhile, and support their use of it (Miller, 2005; Malhotra & Galletta, 1999; Venkatesh & Morris, 2000). Given that M-pesa can help facilitate money transfer between members of a socio-economic community, this study aims to test its applicability amongst the two sample contexts of this study.

Thus the third hypothesis:

H3: Subjective norm will have a positive effect on an individual consumer's intention to use M-pesa.

2.9.3.4 Self-Efficacy

A consumer's self-efficacy with the use of M-pesa is relevant because of the self-service aspect in using the financial service. To send money, a user initiates the process without the need to involve a third party. A consumer with greater confidence in his or her ability to leverage or use M-pesa for advantage will be more likely to form positive intentions towards its use (McKee *et al.* 2006; Venkatesh & Speier, 2000; Fenech, 1998). Hence, an individual's perception of their ability to use M-pesa, will affect their intention to use the service.

Thus, the fourth hypothesis:

H4- A high perception of self-efficacy will have a positive effect on an individual consumer's intention to use M-pesa.

Switching costs

The following variables and hypotheses in sub-section 2.8.3.5- 2.8.3.10 are derived from switching cost theory.

2.9.3.5 Pre-switching search and Evaluation Cost

According to Jones *et al.* (2002), Whitten & Wakefield (2006), and Lacity & Willcocks, (2000), pre-switching search and evaluation cost refers to a consumer's opinion of the time and effort required to get information about existing service substitutes and evaluating his or her capability before making a decision to switch.

M-pesa is an alternative financial service that facilitates consumer transaction needs. It is the first of its kind, and its services are unique because they extend to an unreached, unbanked population in society. Individuals who then have a need to transact with the previously unreached population would need to acquire the necessary information pertaining to the use of M-pesa. The amount of time and effort that would be expended for this search is suggested to influence an individual's intention to use M-pesa (Jones *et al.* 2002; Burnham *et al.* 2003). Consumers are more likely to use M-pesa if the amount of time and effort required to get information about using the service is minimal. To this end, it is anticipated that a pre-switching search and evaluation cost of M-pesa might apply to prospective users.

Thus the fifth hypothesis:

H5- Perceived high pre-switching search and evaluation cost will have a negative effect on an individual consumer's intention to use M-pesa.

2.9.3.6 Lost performance cost

Turnbull and Wilson (1989) and Gwinner, Gremler, & Bitner (1998) refer to lost performance or lost benefits as tangible and intangible gains that an individual would have accumulated as a result of continued patronage. Businesses tend to offer benefits as an enticement for a continuous relationship with customers.

Jones *et al.* (2002) cite a few examples where this cost applies. The first given example is where a consumer would accrue frequent flier miles for their continued patronage with an airline. However, if they do terminate the relationship with the airline, they forfeit the benefits.

Another example is a scenario where consumers frequent a restaurant. They could be given preferential treatment for reservations, for example, as incentives. However, should they cease patronage, they could lose that privilege. These kinds of benefits are the basis for an individual to remain in a service relationship (Beatty, Mayer, Coleman, Reynolds, & Lee, 1996).

The same logic applies in the financial service sector, where customers could lose certain benefits and potentially lose their loyalty and rewards status if they reduced the number of transactions that they made with the institution.

Hence, in switching to use M-pesa, consumers could grapple with lost performance cost, and are more likely to remain with their current service provider if they perceive that the loss faced outweighs the benefits of switching to M-pesa.

Thus, the sixth hypothesis:

H6- A high perception of lost performance will have a negative effect on an individual consumer's intention to use M-pesa.

2.9.3.7 Post-switching behavioural and cognitive costs

This dimension of switching cost is based on the belief that learning goes beyond switching, because consumers actually need time to feel comfortable with the new service or product (Jones *et al.* 2002). In accordance, Nielson (1996) suggests that, in a business relationship, all parties must familiarize themselves with the stipulated processes, because it will allow smoother business operations.

Given that post-switching behavioural and cognitive costs are the effort and time needed to master the use of a service, and that the target population of M-pesa have had little or no prior experience with conducting financial transactions using a mobile phone, it is anticipated that a post-switching behavioural and cognitive cost would apply to them and weigh on their decision to use the service.

Thus the following hypothesis:

H7- A high perception of post-switching behavioural and cognitive cost will have a negative effect on an individual consumer's intention to use M-pesa.

2.9.3.8 Sunk Cost

Sunk costs are economic and psychological expenditures which were invested in a previous exchange relationship (Dick & Lord, 1998). They capture consumer perceptions of the invested time, money, and effort which a prior relationship was built on. Hence, all dimensions of switching cost become sunk cost after a switch has occurred (Jones *et al.* 2002).

When applied to consumer intention to use M-pesa, sunk cost provides insights on an individual's psychological state when making the decision to switch. If their relationship with the previous financial service provider cost them little time, effort, and money, then their perception of sunk cost will be low; however, if the reverse is the case, then perceptions of sunk cost will be higher and the consumer will be more reluctant to part with that investment.

Thus, the eighth hypothesis arises:

H8- A high perception of sunk cost will have a negative effect on an individual consumer's intention to use M-pesa.

2.9.3.9 Setup cost

Setup costs are expenses incurred in starting an exchange relationship. Jones *et al.* (2002) put forward that should service customization be high, which is often the case in this relationship, there will be additional costs incurred. This cost arises from the expenses that a service provider invests in learning/training activities which are necessary in order to ensure customer contentment (Jones *et al.* 2002). While it is no news that cost incurred by businesses are often relayed to the consumer (Guiltinan, 1989), these expenditures increase the cost of an exchange relationship.

In the context of this study, the setup cost for M-pesa may be postulated as minimal because there is no signup fee required to begin using the service; start-up is free. However, there are some varying tiers of transaction fees. Thus, without adequate information on the start-up process, consumers confront some initial complexities in using the service. In addition, for consumers, who intend to use the service for transacting with relatives, friends, and clients who are not technologically knowledgeable, the perception of effort and time that an individual might expend in training these persons might be deemed expensive. Hence this construct would help capture consumers' perceptions about the setup cost (monetary or time) involved in using M-pesa.

Thus, the following hypothesis:

H9- A high perception of setup cost will have a negative effect on an individual consumer's intention to use M-pesa.

2.9.3.10 Uncertainty Cost

The idea of switching from a familiar service to an unfamiliar service raises feelings of uncertainty, because the value of the service will be fundamentally based on expectations rather than on knowledge.

Whitten and Wakefield (2006) posit that the more standardized a service is, the less uncertainty cost will be involved. This is because prospective consumers would have some knowledge about the operations of the service and the likely benefits that they will accrue. However, uncertainty is high when the value of the service is difficult to discern.

M-pesa is the first of its kind and consumers would have had little or no experience with its service level. On this note, their perception of the worth of the service would be solely based on expectations, thus giving rise to uncertainty cost in making a decision to use the service.

Thus, this work's final hypothesis:

H10- A high perception of uncertainty cost will have a negative effect on an individual consumer's intention to use M-pesa.

2.9.4 Control Variables

The inclusion of control variables in a study helps provide added insights into patterns that emerge as a result of demographic data (Brace, Kemp, & Snelgar, 2006). The control variables in this study (age, gender, education, and income) have been included based on findings of their influence in prior related studies (Gefen & Straub, 1997; Polatoglu & Ekin, 2001; Venkatesh & Morris, 2000; Lee, Lee, & Eastwood, 2003; Venkatesh *et al.* 2003).

2.8.4.1 Age

Prior research (McCarty & Shrum, 1993; Venkatesh & Morris, 2000; Venkatesh *et al.* 2003) that has investigated the effect of age differences in consumer use of technology have shown that, compared to older persons, younger people's technology use decisions are influenced by their attitude towards the use. On the other hand, subjective norms and perceived behavioural control have a stronger influence on older persons. Given the proposition on the effect of age

on consumer intention to use, this study seeks to examine its impact on consumers' intentions to use M-pesa in an African context.

2.9.4.2 Education

Research by Polatoglu & Ekin (2001) and Lee, Lee, & Eastwood (2003) show that higher educated individuals are more willing to change and use innovative technologies. In light of this, the current study aims to reveal whether this finding holds true amongst the sample unit for this study.

2.9.4.3 Gender

A survey conducted by Gefen & Straub (1997) showed that women use mobile devices more often than men possibly because of their greater social and networking needs. Subsequently, studies by Venkatesh & Morris (2000) and Venkatesh *et al.* (2003) go on to highlight that young male users are more likely than females to consider PU important, and to use a technology. The reason being, in many cases, men use technology for the sake of it facilitating their jobs. Consequently, gender could play a role in explaining a consumer's intention to use a technology-based product.

Thus, demographics capturing gender will be included in this study to assess if respondents' genders have any effect on their intention to use M-pesa.

2.9.4.4 Income

The income variable has been included in this study to identify the income brackets of consumers which intend to use M-pesa. Although the service was intended for the unbanked, studies have shown that most remittances are urban-to-rural based (Oucho, 1996; Owour, 2004), implying that middle-income/high-income consumers use M-pesa for sending money, while the low-income consumers use it as a medium for receiving money. This study's focus on low-income through sampling has enabled a methodological control of this factor.

2.10 Chapter Conclusion

This chapter presented a background on the sample contexts for this study, a review and discussion of various relevant prior researches, thus showing the current state of research in the direction of adoption of mobile based services in Africa. Possible factors that could affect consumer intention to use M-pesa within and between Kenya and South Africa were presented as an answer to research question 1. Based on the discussions of the reviewed

work, this study's research model and hypotheses were formulated and justified to account for individual consumer intentions to use M-pesa.

In the next chapter, appropriate research methodologies for answers to research question 2 and 3 will be selected and discussed. This will entail the research design strategies and how they will be executed.

Chapter 3- Research Methodology

3.1 Chapter Introduction

In the preceding chapter, various related literature on technology acceptance, consumer behaviour, and computing behaviour were discussed, factors influencing usage intentions were identified, a research model was developed, and hypotheses were generated.

This chapter describes and justifies: the research design strategy, data collection method, and analysis strategy that will be used to answer research questions 2 and 3.

Research question 2: To what extent do Kenyan and South African consumers differ in their intentions to use M-pesa and in their perceptions of the individual level factors identified by research question 1?

Research question 3: What are the effects of the selected individual level factors on South African consumers' intentions to use M-pesa?

3.2 Research design strategy

The processes and techniques that were adopted in designing this research study are discussed next.

3.2.1 Research design

A research design is essential for planning and structuring a research study, so that the validity and reliability of acquired results is maximized (Terre Blanche, Durrheim, & Painter, 2008). To ascertain the most suitable design for a research study, it is imperative that the researcher examines the research problem and the goal of the study at hand (Ghauri & Gronhaug, 2005).

Two prevalent research approaches used by social science researchers are quantitative and qualitative methods.

Quantitative research is one where data is expressed in figures, and involves the measurement of facts and variables (Neuman, 2006). In addition, predictor and criterion variables are forthrightly identified (Creswell, 2003). The researcher then defines a construct, and assembles measures for it prior to the data collection phase (Neuman, 1994). This then allows for statistical analysis of the data collected. This research methodology is thus suited for studies that aim to validate relationships between several predictor variables and one or more

criterion variable (Leedy & Ormrod, 2005). Other key characteristics include the use of larger samples from which to collect data.

Qualitative research aims to gather data in form of words, and data is usually acquired through observations and interviews. This approach is most useful when the researcher aims for an in-depth understanding of a certain phenomenon (Ghauri & Gronhaug, 2005).

In summary, to distinguish between the two predominant research approaches, Stake (1995) suggests three key differences.

Table 3.1 *Distinctions between quantitative and qualitative research approaches*

	Quantitative Research	**Qualitative Research**
Purpose of enquiry	The researcher seeks to predict a phenomenon	The researcher seeks to explain a phenomenon
Researcher's role	Impersonal	Personal
Knowledge base	Constructed	Discovered

While most of the studies that have been carried out on consumer intention to use mobile technology-based products, more specifically use of mobile payment services in Africa have been largely qualitative in nature (e.g Ngugi *et al.* 2010; Morawcynski & Miscione, 2008; Morawcynski, 2008; Jack & Suri, 2011), a few quantitative empirical studies (Brown *et al.* 2003; Mbogo, 2010; Meso *et al.* 2005; Tobbin & Kuwornu, 2011) have been carried out, and this study aims to build upon prior work in this space. A quantitative approach can be either confirmatory or exploratory; a confirmatory approach is adopted when the researcher is quite certain about the issues surrounding a phenomenon, whereas exploratory is used when there is uncertainty around a trend.

This study explores consumer intention to use M-pesa by comparing low-income consumers in Kenya and South Africa and lends itself to a quantitative approach. This approach was chosen because it enables the researcher to determine the quantity of observations around the hypotheses of the research problem on the sample population (Pinsonneault & Kraemer, 1993). Additionally, Pinsonneault & Kraemer (1993) note that social science researchers

have endorsed the use of survey instruments when a study is about the relationships between several predictor variables and a criterion variable.

Given that research around technology use in Africa is largely discovery-oriented because there are few past studies focused on this consumer group (Walsham et al. 2007), the researcher deemed that the current study should lend itself to an exploratory research approach. This approach is ideal because the phenomena surrounding the use of M-pesa are still under speculations.

Terre Blanche *et al.* (2008) put forward that exploratory research should lend itself to statistical measures (quantitative approaches) which can be used to firstly describe and compare within and between samples with respect to various factors or variables, as well as to test the relationship between several predictor variables on a criterion variable. In this vein, this approach is useful for the objectives of both research question 2 and 3.

3.3. Data Collection

A key consideration for a quantitative study is data collection, and this involves the selection of factors and ways to communicate with respondents, sampling, analysis, timing, budget constraints, amongst others. The methods employed for this study are discussed next.

3.3.1 Data collection method

There are various options available for data collection for a quantitative research study. However, a prevalent method employed in most studies is the use of a survey instrument, and this could be administered online or paper based. Survey instruments are used when a researcher aims to collect data on a phenomenon that is not clearly understood, and data is usually collected using questionnaires that have close-ended questions.

The constructs in the Survey Instrument for this study were adopted from studies on consumer behaviour and computing behaviour. The rationale for the constructs selection was based on the notion that a combination of consumer behaviour and computing behaviour will better cater for the prediction of adoption intention towards M-pesa.

3.3.2 Construction of the Research instrument

In order to ensure a high level of validity for a study, Bailey (1982) recommends drawing from prior validated instruments. In this study, the measurement of the models constructs were adopted from studies which have reported high validity scores. Validity is measured in

various forms, and in this study was tested in terms of face, content, construct, convergent, and discriminate.

The constructs used in this study were adopted from the following studies - listed in Table 3.2 below - which has investigated similar issues.

The Survey Instrument-Questionnaires, using a 7-point likert scale, were used to collect data. (See Appendix C1 and C2 for measurement items per construct).

Given that the Kenyan data was collected before the South African data, any items in the Kenyan dataset to exhibit low reliability were eliminated prior to data collection in South Africa. The items are summarized below.

Table 3.2 *Instrument Construction*

Construct	Source	Number of Items (Kenya)	Items surviving reliability tests in Kenya	Number of Items (South Africa)	Identical items in Kenya and South Africa questionnaire
Perceived Usefulness	Venkatesh & Bala, 2008.	7	4	4	4[a]
Perceived Ease of Use	Venkatesh & Bala, 2008.	5	3	3	3[a]
Subjective Norm	Venkatesh & Bala, 2008.	4	3	3	3[a]
Self-Efficacy	Venkatesh & Bala, 2008.	4	3	3	3[a]
Evaluation Cost	Jones *et al.* 2002. Burnham *et al.* 2003.	5	0	3	0[c]
Lost Performance	Jones *et al.* 2002. Burnham *et al.* 2003	9	3	5	3[b]
Sunk Cost	Jones *et al.*	3	1	3	1[b]

	2002. Whitten & Wakefield, 2006.				
Uncertainty Cost	Jones *et al.* 2002	5	5	3	5[a]
Post Switching Cognitive & Behavioural Cost	Jones *et al.* 2002	3	2	3	2[a]
Setup Cost	Jones *et al.* 2002. Burnham *et al.* 2003.	3	0	3	0[c]
Intention to Use	Venkatesh & Bala, 2008. Burnham *et al.* 2003.	7	3	4	3[b]

Note:

a items retained from Kenyan questionnaire and used in South African questionnaire without additional replacement items.

b. Additional items were used in the South African context in order to improve measurement of the scale. Comparison between Kenya and South Africa are based on common items only.

c. Due to measurement problems this factor could not be compared across contexts. Measurement improvements to the South African questionnaire were made for the purpose of answering research question 3.

Each construct in the survey possessed at least two items, and participants were invited to indicate their level of agreement with the statements by marking on a 7-point likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree).

3.3.2.1 Face validity

This form of validity measures the extent to which the proposed study seems to capture what it should capture (Eachus, 1999). As a measure of testing face validity, a pilot study protocol was carried out, because it is deemed the first point of protocol for the research process (Hair, Anderson, Tatham, & Black, 1998), and was administered amongst a small fraction of the chosen sample. Pilot tests were carried out in a community in each context. In Kenya, a pilot test was carried out in Embakasi community in Nairobi, while in South Africa; a pilot test

was carried out in Tsakane community. These communities were selected because the residents are representative of this study's sample frame. Thus, the pilot helped in ensuring that participants could understand the instructions given to complete the questionnaire, could adequately answer the questions and interpret the items, were able to answer the questions by using the scales, and that the time required to complete the instrument was in line with the estimated 15-25 minutes. Twenty people participated in the pilot in both countries, and preliminary statistical analysis was carried out, for example, to examine the standard deviations (variance) in the responses. This aided in the identification of possible problems that needed to be addressed prior to the main data collection stage of the study.

3.3.2.2 Content validity

Hair *et al.* (1998) state that content validity is an organized review of the proposed research instrument. This review helps determine whether or not the survey instrument items actually capture the respective query of each construct. To ensure this form of validity in the present study, a review of the survey instrument was carried out in the University of the Witwatersrand, Johannesburg IS division. Three lecturers, two Masters Students, and a Doctoral student participated in the review. These individuals' have all been involved in studies pertaining to IT adoption and/or have reviewed published and presented papers on the topic. Their feedbacks helped in confirming that the scale items selected were appropriate choices and were adequate given the objectives of the study.

3.3.2.2.1 Effects of the Pre-test and Pilot Test

The pre-test review by the scholars at University of the Witwatersrand's IS Division and a pilot-test prompted the following changes, noted in Table 3.3 below.

Table 3.3 *Modifications made to Survey Instrument administered in Kenya*

Construct	Original Item	Revised Item	Rationale for revision
Lost Performance	LP-9- If I started using M-pesa, I would lose connections with *the people* who used to provide me with services of sending and receiving money.	If I started using M-pesa, I would lose connections with my *other services* of sending and receiving money.	The term "the people" made it unclear; rather, "other services" was more appropriate. The rephrased item is believed to capture the query more explicitly.
Setup Cost	SetCost1- Starting to use M-pesa would require me to show people that I send money to/receive money from how it works.	Starting to use M-pesa would require me to show people that I send money to (receive money from) how it works.	Improves readability of the question.
Subjective Norm	SN 1- My friends would think I should use M-pesa." It was changed to read	My friends think I should use M-pesa	The word "would" made the statement indirect, and a more explicit probe was a "yes or no" approach.
Perceived Ease of Use	PEOU 4- I think M-pesa is easy to understand.	I think M-pesa is very easy to understand	To bring variation in responses.
Income	Less than KSh700,000 Between KSh 700,000-1,000,000 More than KSh 1,000,000.	Less than KSh 100,000. Between KSh 100,000 – 200,000. Between KSh 201,000 – 300,000. Between KSh 301,000 – 400,000. Between KSh 401,000 – 500,000. More than KSh 500,000.	Results from the pilot test showed that 99% of respondents earned less than KSh 700,000. Thus, creating categories below this range was necessitated.

3.3.2.3 Construct Validity

This study's measures were mostly defined by adopting /adapting validated scales from prior research studies. Thus the chances of poor construct validity and cross-loading was reduced (Pallant, 2007). This technique allows items that correlated highly with each other to form a component or factor (Bailey, 1987). Principal Component Factor Analysis (PCFA) is a technique that is used to derive an optimal way of merging variables into a reduced number of subsets (Abdi & Williams, 2010). It could be used as an exploratory or confirmatory technique. In selecting an appropriate factor analysis approach, the researcher considered both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). CFA is mostly used in verifying that measures of a construct are consistent with the researcher's position on the construct, whilst EFA explores and identifies possible underlying factor structures (Child, 1990).

Thus, given that very few studies have been conducted in this space, an exploratory factor analysis (EFA) was selected over a confirmatory factor analysis (CFA) approach, as the researcher sought to uncover possible unknown factors that best represent the data.

3.3.2.4 Convergent and Discriminant Validity

Convergent validity is a test to reveal whether a relationship exists between constructs that should have relationships, while discriminant validity tests whether unrelated constructs actually are unrelated (John & Benet-Martinez, 2000).

In this study, convergent and discriminant validity is established by calculating the average variance extracted (AVE) for each construct based on the results of the PCA. AVE assesses the level of variance that is accounted for by a construct with respect to the level of variance resulting from measurement error (Fornel & Larker, 1981). As noted by Chin (1998), convergent validity is attained when the AVE for each construct is above 0.50. Discriminant validity will be tested by taking the square root of each construct's AVE (RAVE) and comparing them against the correlation of the construct with other constructs (Chin, 1998).

3.3.2.5 Reliability

Cronbach's Alpha statistics will be used to measure the internal consistency of the data collected. The Cronbach Alpha reliability coefficient ranges from 0 to 1, and despite the fact that the coefficient has no lower limit, the closer it is to 1, the stronger the reliability of the

instrument (Gliem & Gliem, 2003). However, Hair, Black, Babin, Anderson, & Tatham (2006) recommend reliability scores of 0.7 or higher as an ideal threshold.

Once satisfied as to the reliability and validity, composite scores can then be calculated for use in the data analysis that will involve comparing Kenya and South African respondents (research question 2) and relating the factors to usage intentions (research question 3). These analyses are discussed later in this chapter. First, the researcher discusses how the South African instrument was improved for the purposes of answering research question 3.

3.3.2.6 Refinement of Survey Instrument administered in South Africa.

Data was collected in Kenya first. Following this, an initial factor analysis and reliability test was conducted on the Kenyan data, and given that this is an exploratory study, the researcher adopted the most promising items from the initial analysis and replicated them in the survey instrument that was administered in South Africa. Also, the researcher corrected some weaknesses in the instrument that was administered in Kenya, by replacing items that had low reliability scores.

Below is a breakdown of the modifications which were made to each construct in the instrument administered in the South African context.

3.3.2.6.1 Perceived Usefulness

The first change was to the PU construct. In the instrument administered amongst the Kenyan sample, there were 7 items used in measuring this construct. However, after a preliminary analysis, the items split into two factors, hence a decision to select the items with higher factor loadings and more explicit wording with the measured variable was the selection criterion. PU 1, 2, 3, and 6 from the instrument used in Kenya were therefore adopted for the instrument administered in South Africa.

3.3.2.6.2 Perceived Ease of Use

The second revision of the instrument also involved a selection of items measuring PEOU from the instrument used in Kenya. There were five items measuring PEOU in the Kenyan context, and the results from the preliminary analysis showed three items with high factor loadings (PEOU 1, 4, 5) that measured PEOU. Thus, these items were replicated for measurement in the South African context.

3.3.2.6.3 Lost Performance

The items measuring lost performance in the Kenyan context were nine in number. Following the preliminary analysis carried out on the data collected in this context, only three (LP 5, 6, 7) of these items loaded as a single factor, and also proved reliable after a reliability test was carried out. These three items were therefore adopted for use in the South African context. Furthermore, two items were included for the South African instrument from a well-cited study (Burnham *et al.* 2003), to supplement the measurement of these three items. Comparisons (research question 2) will be based on the three common items, whilst tests of the model in SA (research question 3) will make use of the extended instrument.

3.3.2.6.4 Evaluation Cost

Five items were adopted for measurement of Evaluation Cost in the Kenyan context. These items however, were completely revised, and new items were adopted from another validated and cited study for the South African context (Burnham *et al.* 2003). The issue here was that the items correlated lowly with each other, and following a reliability test, their loadings were unreliable. Kenya and South African cannot therefore be compared against this factor.

3.3.2.6.5 Uncertainty Cost

All items (5) measuring this construct were retained for both contexts. Although, only two items proved reliable, efforts made to adopt better validated items proved null. The reason being, items measuring this construct in various validated and cited studies (Burnham *et al.* 2003; Whitten & Wakefield, 2006) were similar. Thus, the same items were administered in the survey in the South African context.

3.3.2.6.6 Post Switching Cognitive and Behavioural Cost

This construct included two items for measurement in the Kenyan context. While these two items loaded as one factor, and had high reliability scores, the researcher decided to include supplementary items for an even more reliable instrument in South Africa. Hence, for this construct, three items were included from another validated and well cited study (Burnham *et al.* 2003) making a total of five items in the South African instrument. The comparison (research question 2) will however be based on the two common items.

3.3.2.6.7 Setup Cost

The results of the preliminary analysis on the data collected in Kenya showed that only one out of three items measured this dimension. Thus, a new set of items were adopted for measurement in South Africa, in addition to this retained one. These new items were adopted

from a similar study that reported high validity and reliability scores (Burnham *et al.* 2003). Given that only one item is similar across contexts, if the identical item loads during the factor analysis test as a distinct component, then a comparison between Kenya and South Africa will be made.

3.3.2.6.8 Sunk Cost

Five items were used to measure this construct in Kenya. Following a preliminary analysis, four of the items were dropped because they were lowly correlated and proved unreliable. As a result, new items were adopted for the South African instrument from other validated and cited instruments (Burnham *et al.* 2003). Again, a comparison on this item between Kenya and South Africa will be carried out if the identical item loads as a distinct factor.

3.3.2.6.9 Subjective Norm

Three items were used in measuring the Subjective Norm construct in the Kenyan context. The preliminary analysis showed that all items were valid and reliable, and were therefore replicated for use in the South African context.

3.3.2.6.10 Self-efficacy

Measures for self-efficacy in the survey instrument administered in Kenya captured four items. Amongst these, three loaded as a single factor, following the preliminary analysis conducted on the data set. Thus, these three were adopted for measurement in the South African context.

3.3.2.6.11 Intention to Use

Consumer intention to use was measured using seven items in the Kenyan context. Given that this is an emerging area of study, although only four items were adopted from prior validated studies (Venkatesh & Bala, 2008; Burnham *et al.* 2003), an additional three items were and operationalized to capture individuals' self-reported probability of using the M-pesa service when next needing to transact, as well as individuals' preference for the use of M-pesa over other services/methods for transacting. However, only three of these seven items loaded as a single, reliable factor. While these three measures were sufficient to capture consumers' perceptions in the South African context, a fourth item was included "I am very likely to use M-pesa in the next six months" to supplement the constructs query (Burnham *et al.* 2003). Consequently, these four items were adopted for the instrument used in South Africa. A final copy of the South African instrument can be seen in Appendix B.

3.3.3 Unit of analysis

Terre, Blanche *et al.* (2008) put forward that the unit of analysis of a study helps identify a specific unit to be investigated. Given that this study focused on consumers' intentions to use M-pesa in two countries, the unit of analysis was both 'individual' and 'group'.

The individual aspect, the first part of this study, focused on the level of the individual consumer in both countries. The group aspect compared results across contexts.

3.3.3.1 Sample Frame

Pinsonneault & Kraemer (1993) note that sampling provides a lens through which individuals are drawn from a large population, thus enabling a generalization regarding the phenomena under investigation. A non-probability sample approach was selected, more specifically, purposive sampling approach. This approach was chosen because the current study focuses on individuals in low income communities, which is a selected target group. Purposive sampling helps in ensuring that the study captures the opinions of the target population.

This sample context was selected because M-pesa was launched primarily to cater for the financial transaction needs of this category of people. In view of this, the current study being a comparative one, involved data being collected in various communities in Kenya and South Africa. In Kenya, data was collected from individuals' in Mathare, Githurai, and Embakasi communities in Nairobi. While in South Africa, the researcher collected data from individuals in Kagiso, Tskane, and Hilbrow communities in the Gauteng province. These communities were selected on the basis that its residents fall in the lower income bracket of society.

Five hundred questionnaires were handed out to individuals in each context with the hope of getting at least 100 useable responses from each country.

3.3.3.2 Background on Participant Communities

This section provides a brief background on the surveyed communities.

3.3.3.2.1 Surveyed communities in Kenya

Githurai

The Githurai community is situated in the eastern part of Nairobi, and it is deemed as a slumurbia[30]. It is a residential area that houses lower income citizens.

According to a report from the Kenyan Bureau of Statistics, Githurai has a population of 320,729, and the majority of these persons are children and youth (KUGP[31], 2011).

[30] Slumurbia is a term for older suburbs that have become depleted (urbandictionary.com, 2011).

Furthermore, KUGP (2011) notes that 47% of the population live below the poverty line. These individuals lack access to proper healthcare facilities, good housing infrastructure, and quality education.

Embakasi

The Embakasi community lies within the east of the central business district in Nairobi, with a population of approximately 619,390 people (KNBS, 2009). It is a few kilometres away from the Jomo Kenyatta International Airport, and also an area characterized by high unemployment rates, numerous informal settlements, and poor sanitary conditions (Ochieng & Ochola, 2011).

Mathare

The Mathare community consists of a group of slums in Nairobi, and has been estimated to house about 500,000 individuals, of whom 60% are youths (Gettleman, 2006). Mathare is reported to be one of the largest and oldest informal settlements in Kenya and East Africa (Thieme, 2010).

3.3.3.2.2 Surveyed communities in South Africa

Tsakane

Tsakane[32] is a black dominated township in South Africa, and was founded in the early 60's during South Africa's Apartheid-era. It is mostly made up of small brick houses, and significantly large informal settlements.

Hilbrow

Hilbrow is also a slumurbia in Johannesburg. It is a highly populated community, and unemployment rates are high. The majority of its residents are migrants from the townships in the country, and some of the continent at large (Gotz, 2004).

Kagiso

Kagiso[33] township is a low socio-economic black dominated community located in Krugersdorp, Gauteng province. This community is currently home to approximately 190,000 people.

---

[31] Kenyatta University- Githurai Partnership

[32] http://en.wikipedia.org/wiki/Tsakane

3.3.4 Survey Instrument Administration

The mall intercept (face-to-face) method was used to select and approach individuals in the sample communities. It is a cost effective, personal interviewing method that yields high quality accurate data in a timely manner (Alan, Bush, Joseph, & Hair, 1985). In using this method, the researcher trained five assistants who helped in the administration of surveys to the participants. The survey instruments were administered in malls and open market spaces located in the sample communities, and the researcher, supported by his assistants, administered the surveys to individuals' in these communities at different times of the day. Between the hours of 8am – 5pm, every 5th person that walked by the researcher or his assistants was approached and asked if they would consider participating in the survey. The researcher and his assistants were available throughout the data administration phase for consultation on any unclear questions. This data collection method was selected to ensure a diverse response pool from the purposive sample population (Alan *et al*. 1985). Participants were not incentivized to participate in the study.

Data collection for the study took place over an eight week period; three weeks in Kenya, and five weeks in South Africa.

3.4 Data Analysis

IBM statistical package for social sciences (SPSS) statistics software, Version 17 was used.

The use of a paper-based survey instrument required that the data from the individual questionnaires were inputted into an SPSS spread sheet. Thereafter, the following steps were taken.

Step 1- Screening and cleaning of the data

The processes in this step ensured that the data was free from violation of sampling frame, outliers, missing values, non-response biases, and transformation of non-normal variables. Following this, the extracted data was labelled numerically and distinctly grouped.

Step 2- Create participants response profile

Data from the survey instrument captured demographics from the two sample contexts and were depicted in cross-tab tables.

[33] http://en.wikipedia.org/wiki/Kagiso

Given that some items were revised after the survey administration in Kenya, there were some dissimilar construct items across the instrument. Thus, to enable a comparison (research question 2), only common items were pooled from the survey instruments administered in both contexts.

Step 3- Test for Validity and Reliability

At this point, validity and reliability tests were carried out through PCFA, AVE, and Cronbach's Alpha coefficient, as referred to above.

The data for each sample was separately examined. It was desirable that the factor structures for the two sample contexts to be similar so as to enable subsequent comparisons.

Step 4- Data Analysis

Various data analysis techniques including Pearson's correlation analysis[34], ANOVA[35], and T-tests[36] or Mann Whitney U-test were used to test the strength of association between the independent variables and the dependent variable.

Step 5 – Comparing the two samples

Research question 2 aims to examine the differences between Kenyan and South African consumers in their levels of use, intention to use, and in their perceptions, and attitudes towards M-pesa.

In order to compare the two samples, the researcher pooled the common items within the Kenyan and South African data. Thereafter, validity and reliability tests were run, and these were confirmed among these items. Composites were calculated based on the factors that emerged in both contexts, descriptive statistics were presented, and the factors were tested with a Mann Whitney U-test. The final decision to use a Mann Whitney U-test was based on the distribution of the data collected.

The Independent sample T-test is a parametric test, and is suitable for data that has a normal distribution, while the Mann Whitney U-test is a non-parametric test that treats a given data

[34] Pearson's correlation is a technique used to determine the strength of association between two variables.

[35] ANOVA is an inferential statistical test that enables analysis of data with two or more experimental conditions.

[36] A T-test is an inferential test that allows for analysis of parametric data from two-sample groups.

set as though it were not normally distributed. These tests are usually used when the researcher aims to examine the significant differences on the dependent variable between the means of two groups, as is the case in this study, where the researcher intends to discover whether there is a significant difference in the level of adoption intentions between Kenyan and South African consumers.

Step 6- Testing the model using the South African data set

Research question 3 aims to examine the effects of the selected factors on the South African consumer's intention to use M-pesa.

The correlation test was used as a basis for validating the relationships hypothesized in this study, as supported by Aldrich (1995), who explains that correlations are valuable tools because they can show a predictive relationship which can be used in practice. The p-values, which indicate the level of significance, were calculated for each hypothesis to determine whether or not the hypothesis is significant at $p<0.01$, hence revealing how strongly related the variables are to each other.

In addition, the strengths of these relationships were interpreted in line with Cohen's (1988, p 79-81) naming scheme, as depicted in Table 3.4 below.

Table 3.4 *Naming scheme for correlation results*

Strength of relationship	R value
Low	0.1- 0.29
Medium	0.3- 0.49
High	0.5- 1

Following this test, PLS regression was used to deduce the strength of each predictor variable on the dependent variable, and subsequently the researcher could determine the beta coefficients and R-squares. The beta coefficients are factors (numbers) that are standardized against each other to show the relative strengths; The R-square is often referred to as the coefficient of determination, and determines the ratio of the sum of squares, which is explained by the regression model and the cumulative sum of squares around the mean.

Finally, PLS analysis was also used to provide a more rigorous test of a final parsimonious model.

3.5 Ethical Considerations

The practice of ethics in conducting research is crucial, and gaining the trust of respondents is paramount. It is therefore necessary to provide an environment that is conducive to openness and transparency.

An ethics clearance application was submitted to the University of the Witwatersrand-Johannesburg's Ethics Committee, and was unconditionally approved (Protocol Number: H110704). See Appendix I. This research was carried out in a manner that ensures each participant's anonymity and the confidentiality of their data (Terre Blanche *et al.* 2008). It was achieved by ensuring that participants did not provide any identifying information beyond their basic demographic details; only aggregate results were reported and participants were not identified by name in the final report. Moreover, participation in this study was entirely voluntary because participants were informed that they may choose to opt out at any time without any loss of benefits due to them. The individual's decision to complete the survey was taken as their formal consent. No third parties will be provided any access to the raw data.

Finally, the researcher has no financial interest, does not work for Vodafone, or/and its subsidiaries, and no incentives were offered to participants.

3.6 Limitations of this study

This study lends itself to a quantitative method, and one possible limitation of this method is that an in-depth understanding of the phenomenon being explored may not be realized. However, given that the study aims to report perceptions on an aggregate level, a quantitative method was deemed more suitable. Secondly, the sample unit of this study were individuals in low-income communities. Given this context, there is the possibility that certain persons in these communities may not have adequate literacy to understand the questions put to them. This could bring about flaws in the data to be analysed. However, the researcher and his assistants were available throughout the data collection process for consultation on any unclear question.

In addition, a key limitation to this study is its focus on a relatively small purposive sample size in both contexts. The responses obtained may therefore not be generalizable to their respective communities. Given that the mall-customer may not reflect the general population, it would be interesting to see the difference in results if the study captured a larger population in both contexts. Thus, future studies in this research space including other areas and communities will be eligible.

Finally, common method bias may arise from respondents self-reported usage intention because they provide measures of the predictors and criterion variable (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

3.7 Chapter Conclusion

This chapter described the research methodology adopted for this study. A quantitative research approach was selected. Appropriate measures for each construct in developing the model were identified. A description of the data collection method was presented. The data analysis techniques to be employed were discussed. Ethical considerations for the study, and also the limitations of the study were outlined.

The next chapter presents the data collected and the results they yield.

Chapter 4- Data Analysis

4.1 Chapter Introduction

In the previous chapter, the data collection and data analysis strategies were presented.

This chapter presents the analysis of the data collected and the results of the study. First, a profile of the respondents from Kenya and South Africa are separately presented and the data is screened for missing data, outliers, and common methods bias. Next, the researcher turns attention towards research question 2. To answer research question 2, the pooled South African and Kenyan data is checked for validity and reliability, composite index scores are calculated, and descriptive statistics presented in order to determine differences in consumer perceptions towards M-pesa. Next, research question 3 is answered. This involved an analysis of the South Africa data set, and the use of Pearson's correlation and regression tests (PLS) to assess the hypothesized effect of TAM, TRA, SCT, and switching costs on intention to use M-pesa in South Africa.

4.2 Sample Demographics

A total of 445 survey responses (280 in Kenya) and (170 in South Africa) were collected for this study.

Of the two hundred and eighty responses collected in Kenya, 15 cases had to be excluded as they were missing over 50% of data. Thus a total of 265 cases were captured for analysis. In South Africa, 170 responses were collected, but only 150 useable responses were retained for analysis because twenty cases were missing over 50% of data.

Table 4.1 and 4.2 presents a cross-tabulation of the respective sample profiles against each of the data collection sites in Kenya (Table 4.1) and South Africa (Table 4.2). The tables also show demographics of respondents in Kenya and South Africa respectively. The demographic factors captured age, gender, education, income, current use of M-pesa, bank account ownership, and mobile phone ownership. Given that this study is a comparative one, and that M-pesa has been in existence for a shorter time period in South Africa than in Kenya, the researcher considered it necessary to include the question that captured individuals' current use of the financial service.

Table 4.1 *Profile of Kenyan respondents*

Demographic Constructs	Site 1 Embakasi	Site 2 Mathare	Site 3 Githurai	Total
Age				
Less than 18 years	0	0	0	0
18-29 years	89	78	2	169
30-39 years	0	12	62	74
40-49 years	0	0	15	13
50 and older	0	0	6	6
Missing	1	1	1	3
Total	90	91	84	**265**
Gender				
Male	44	58	49	151
Female	46	32	35	113
Missing Values	0	1	0	1
Total	90	91	84	**265**
Education				
Primary School	7	1	7	15
Some High School	1	3	2	6
High School	34	40	25	99
Post High School	10	26	20	56
Some University	9	13	12	34
Bachelor's Degree	21	5	11	37
Postgraduate Degree	7	2	4	13
Other	0	0	2	2
Missing	1	1	1	3
Total	89	91	84	**265**

Demographic Constructs	Site 1 Embakasi	Site 2 Mathare	Site 3 Githurai	Total
Income per annum				
Less than Ksh 100,000	70	66	51	187
Between Ksh 100,000 – 200,000	7	11	15	33
Between Ksh 201,000 – 300,000	0	4	3	7
Between Ksh 301,000 – 400,000	1	0	7	8
Between Ksh 401,000- 500,000	2	1	1	4
More than Ksh 500,000	9	6	7	22
Missing	1	3	0	4
Total	90	91	84	**265**
Current use of M-pesa				
Most of my transactions	33	30	35	98
Some of my transactions	43	44	38	125
Very few of my transactions	9	13	10	32
OR I have never used it	4	3	1	8
Missing	1	1	0	2
Total	90	91	84	**265**
Do you own a mobile phone?				
Yes	90	89	83	262
No	0	1	1	2
Missing	0	1	0	1
Total	90	91	84	**265**
Do you have a bank account?				
Yes	84	71	80	235
No	6	19	4	29
Missing	0	1	0	1
Total	90	91	84	**265**

Table 4.2 *Profile of South African respondents*

Demographic Constructs	Site 1 Tsakane	Site 2 Kagiso	Site 3 Hilbrow	Total
Age				
Less than 18 years	0	0	0	0
18-29 years	33	40	30	103
30-39 years	23	0	9	32
40-49 years	4	1	3	8
50 and older	1	0	2	3
Missing	2	1	1	4
Total	63	42	45	**150**
Gender				
Male	38	21	25	84
Female	24	20	20	64
Missing Values	1	1	0	2
Total	63	42	45	**150**
Education				
Primary School	1	0	0	1
Some High School	0	1	15	16
High School	16	35	0	51
Post High School	19	4	12	35
Some University	5	0	5	10
Bachelor's Degree	12	0	7	19
Postgraduate Degree	5	0	4	9
Other	3	1	0	4
Missing	2	1	2	5
Total	63	42	45	**150**

Demographic Constructs	Site 1 Tsakane	Site 2 Kagiso	Site 3 Hilbrow	Total
Income per annum				
Less than R 10,000	7	16	2	25
Between R10,000 – 30,000	10	3	11	24
Between R31,000 – 60,000	12	2	11	25
Between R 61,000 – 90,000	11	2	10	23
Between R 91,000- 120,000	13	2	5	20
More than R 120,000	7	2	4	13
Missing	3	15	2	20
Total	63	42	45	**150**
Current use of M-pesa				
Most of my transactions	1	1	0	2
Some of my transactions	1	3	0	4
Very few of my transactions	2	3	0	5
OR I have never used it	58	35	44	137
Missing	1	0	0	2
Total	63	42	45	**150**
Do you own a mobile Phone?				
Yes	62	39	44	145
No	0	2	1	3
Missing	1	1	0	2
Total	63	42	45	**150**
Do you own a bank account?				
Yes	61	29	45	135
No	1	10	0	11
Missing	1	3	0	4
Total	63	42	45	**150**

4.2.1 Current use of M-pesa

Based on the results in Table 4.1 Kenyan sample profile, it can be seen that only 8 individuals' out of 265 had not actually used M-pesa. Whilst in South Africa (Table 4.2), only 11 out of 150 respondents had used the service. This suggests that M-pesa is being used by more low-income Kenyans than South Africans. Kenyan participants were however instructed to fill out the questionnaire based on their perceptions towards M-pesa prior to use of it. Given that the aim of this study is to examine the extent to which those perceptions impact consumer intention to use, asking respondents to answer in this manner is consistent with the exploratory approach employed by (Kleijnen, Ruyter, & Andreassen, 2005) in examining consumer intention to use.

4.2.2 Mobile phone ownership

Another interesting observation made is on the extent of mobile phone ownership in the two samples. In both contexts, almost all respondents owned mobile phones [Kenya (96%) and South Africa (99%)]. The results of the South African sample compares favourably with statistics referenced in (Chigona *et al.* 2009) that 85% of the population have access to mobile phones. While mobile adoption rates in Kenya stands at 45.1%, the data shows that majority of the participants in the surveyed communities own mobile phones. This could imply that there is a relatively high penetration rate of mobile phones in Nairobi.

4.2.3 Bank account ownership

This study's findings are contrary to perceptions that low-income individuals rarely operate bank accounts. Amongst the surveyed sample of 265 individuals' in Kenya, the data shows that 235 individuals' reported owning bank accounts. This is an interesting discovery, as statistics by Finscope (2011) reports that only 22.6% of the Kenyan population operate bank accounts. Despite the high report of ownership, Kenyan consumers may be under banked i.e., not well served by banks. This is somewhat supported by the 257 of 265 participants indicating they have used M-pesa.

Amongst the South African respondents, there was similarly high bank account ownership- 135 of 150 respondents. This result is relatively consistent with statistics reported by Payne (2011) stating that 63% of the population in South Africa have bank accounts with higher penetration in urban and peri-urban areas.

4.2.4 Income per annum

Table 4.3 *Income categories and equivalents between the samples*

Number of Respondents	Income in Kenya	Equivalent in South Africa
187	Less than KSh 100,000	Less than R10,000
34	Between KSh 100,000 – 200,000	Between R10,000 – 20,000
7	Between KSh 201,000 – 300,000	Between R21,000 – 30,000
8	Between KSh 301,000 – 400,000	Between R31,000 – 40,000
4	Between KSh 401,000 – 500,000	Between R 41,000 – 50,000
22	More thanKsh 500,000	More than R50,000
Number of Respondents	Income in South Africa	Equivalent in Kenya
25	Less than R10,000	Less than KSh 100,000
24	Between R10,000 - 20,000	Between KSh 100,000 - 20,000
25	Between R 31,000 - 60,000	Between KSh 301,000 - 600,000
24	Between R 61,000 - 90,000	Between 601,000 – 900,000
20	Between R91,000 – 120,000	Between KSh 901,000 – 1,200,000
13	More than R120,000	More than KSh1,200,000

As shown in Table 4.3, a majority (70%) of the respondents in Kenya were ranked in the lowest income category, while amongst the South African respondents there was a close to even spread across all the categories except the "more than R120,000 category." These findings could be as a result of the difference in minimum wage across the two contexts (see Tables 2.1 and 2.2 in Chapter 2). South Africa has a much higher GDP than Kenya, which implies a wider range of economic activities. The variations in respondents' earnings suggest that South African low-income residents earn higher wages than their peers in Kenya.

4.2.5 Education

The results show that individuals in both contexts are fairly educated, as majority of the respondents in each context possess a high school degree. This data is consistent with the CIA World Fact book/Kenya (2011) which shows that 90% of the males and 79.7% of females in Kenya can read and write, as well as their counterparts- 86.4% of males and 85.7% of females in South Africa.

4.2.6 Gender

Both gender categories were well represented in the samples. In Kenya, the survey captured 151 (56%) responses from males, and 113 (43%) from females. Whereas, in South Africa, data was collected from 84 (56%) males and 64 (43%) females. The slightly higher number of males is likely due to their increased receptiveness to the mall-intercept approach used to collect data.

4.2.7 Age

Demographics capturing age show that majority of the respondents in both context were between ages 18-29, 62% in Kenya and 68% in South Africa. The second largest age bracket were respondents falling between 30-39, 28.3% in Kenya and 21% in South Africa. Results are therefore less generalizable to older population groups.

4.3 Data Screening and Preparation for analysis

The following measures were taken in preparation for analysis. Firstly, some of the data on questionnaire responses was reversed scored, and then data was checked for missing values. Following this, the data was examined for outliers.

4.3.1 Reverse Scoring

A few items in the survey instruments administered in both contexts consisted of items that were phrased in the negative and required reverse scoring to align their correlations with the other items measuring the same variables. This reverse phrasing was incorporated in the questionnaire design to improve reliability by keeping participants cognitively alert while filling out the questionnaire and enabling easier identification of response patterns.

The following items were reverse scored before subsequent analysis took place:

Table 4.4 *Reversed scored items*

Variable	Items
Perceived ease of use	I believe that M-pesa will be confusing to use.
Self-efficacy	I could only use M-pesa if I could call someone for help.
	I could only use M-pesa if someone helped me get started.
	I could probably only use M-pesa if I could call someone for help if I got stuck.

4.3.2 Missing Data

Missing data can be viewed from two angles; (i) the number of variables lacking data for each case, or (ii) the number of cases lacking data for each variable (Hair *et al.* 2006).

Subsequent to the omission of responses with more than 50% of the questionnaire omitted, it was still necessary to examine the data further. A rule of thumb suggested by Hair et al. (2006) is that cases missing data under 10% may be retained for analysis, but cases missing data of 15% and over are subject for deletion.

4.3.2.1 Kenyan and South African Samples

Table 4.5 *Missing data*

Construct	Item	Number of Missing Cases			Replaced with series mean
		Kenya	South Africa	Total	
Perceived Usefulness	PU 1	1	2	3	Yes
	PU 2	0	2	2	Yes
	PU 3	3	2	5	Yes
	PU 4	1	1	2	Yes
Perceived Ease of Use	PEOU 1	11	1	12	Yes
	PEOU 2	1	3	4	Yes
	PEOU 3	0	6	6	Yes
Subjective Norm	SN 1	0	3	3	Yes
	SN 2	1	3	4	Yes
	SN 3	0	2	2	Yes
Self-efficacy	SE 1	0	3	3	Yes
	SE 2	2	1	3	Yes
	SE 3	1	2	3	Yes
Lost	LP 1	2	3	5	Yes

Performance	LP 2	0	2	2	Yes
	LP 3	0	3	3	Yes
Uncertainty Cost	UC 1	0	1	1	Yes
	UC 2	1	1	2	Yes
	UC 3	1	1	2	Yes
	UC 4	0	1	1	Yes
	UC 5	4	1	5	Yes
Post-switching Behavioural and Cognitive Cost	PSBC 1	0	2	2	Yes
	PSBC 2	0	1	1	Yes
Sunk Cost	SCOST	3	2	5	Yes
Setup Cost	SETCOST	0	2	2	Yes
Intention to Use	INT 1	0	2	2	Yes
	INT 2	2	3	5	Yes
	INT3	0	1	1	Yes
Total		**34**	**57**	**91**	

Items in only the South African Questionnaire

Variable	**Item**	**Number of missing cases**	**Replaced with series mean**
Setup Cost	SETCOST 1	1	Yes
	SETCOST 2	1	Yes
	SETCOST 3	1	Yes
	SETCOST 4	3	Yes
Post-Switching Behavioural and Cognitive	PSBC 3	2	Yes
	PSBC 4	1	Yes

Cost	PSBC 5	3	Yes
Evaluation Cost	Ecost 1	3	Yes
	Ecost 2	5	Yes
	Ecost 3	4	Yes
Lost Performance	LP 4	1	Yes
	LP 5	2	Yes
Sunk Cost	SUNK 1	2	Yes
	SUNK 2	2	Yes
	SUNK 3	2	Yes
	SUNK 4	2	Yes
	SUNK 5	2	Yes
Intention to Use	INT 4	1	Yes
Total	**38**		

The items column shows the selected items that were used to measure each variable, the missing values column shows the number of missing values for the respective construct, and the fourth column indicates whether or not the missing values were replaced. It should be noted that no single case was missing more than 10% of data (see Table 4.6).

Table 4.6 *Cases missing items for pooled data*

Number of items missing	Number of cases
1	36
2	14
3	5
4 or more	0

To resolve the above cases with missing data, an imputation approach using replacement values was employed. More specifically, mean substitution method was used. It is a widely adopted approach whereby missing data for a variable is replaced with the mean value of the variable in question, by calculating valid responses of that variable (Hair *et al.* 2006). Furthermore, Hair *et al*. (2006) note that the significance of this approach is that the mean is the most suitable substitute value, and it provides all missing cases with absolute data. Missing data fields were thus imputed with the series mean in order to retain the sample size with a complete data set. However, cases with missing demographic data were not replaced with any values.

4.3.3 Outliers

A univariate outlier detection method was selected and used. For all interval data (the scale items), data values were converted into standardized scores which enabled the researcher to examine the distribution of the observations. The data was screened for cases that lay within the tails of the distribution. The standardized scores represent the number of standard deviations away from the mean. Hair *et al.* (2006. p75) recommend that for a sample size of 80 or less cases, outliers are deemed as those that have standardized scores of 2.5 or greater (i.e., more than 2.5 standard deviations from the mean), while for larger samples, the threshold could be placed at 4. Thus, given the sample size of 415 (265- Kenya and 150- South Africa) of this study, the threshold of 4 was used, and 2 cases of outliers were found because they had standardized scores of above 4 within the Kenyan sample and were excluded, leaving a total of 263 cases. Also 2 outliers were detected within the South African sample because they had standardized scores of above 4, and were excluded. Thus, there were 148 cases for South Africa. All together there were 411 cases.

4.3.4 Test for Common-Methods Bias

The researcher checked for possible common methods variance with Harman's single factor test (Podsakoff & Organ 1986; Podsakoff, MacKenzie, Lee & Podsakoff, 2003). An EFA was conducted on all scale items common to both Kenya and South Africa and six factors emerged explaining 71.511% of the variance in this study's constructs. The first factor explains 33.003%, and the sixth factor explaining 3.888% of the total variance. The stated analysis indicates that the data is unlikely to be contaminated by common methods bias (Bhattacherjee & Sanford, 2009), because common methods bias is only likely to be present when one factor accounts for most of the variance (more than 50%) in the dataset (Shen & Khalifa, 2008).

4.3.5 Pooling of Data

This study collected data on a common set of questionnaire items in both Kenya (n=265) and South Africa (n=150) samples. However, after outliers were detected and excluded, the total number of usable responses was (n=263) for Kenya, and (n=148) for South Africa. In order to answer research question two, the data was pooled to enable comparisons. Thereafter, principal component analyses and reliability tests were conducted on the pooled data.

Table 4.7 *Constructs with identical items in survey instrument administered in both contexts.*

Construct	Item	Kenya and South Africa
Perceived Usefulness	PU 1	I believe M-pesa will be useful for me.
	PU 2	I believe that M-pesa will allow me to send or receive money from wherever I am.
	PU 3	I believe that using M-pesa will reduce the time it takes me to send or receive money.
	PU 4*	Overall, I think M-pesa will be less expensive for me to send and receive money.
Perceived Ease of Use	PEOU 1	I think M-pesa is very easy to understand.
	PEOU 2	I believe M-pesa is very easy to use.
	PEOU 3	I believe M-pesa will be confusing to use.
Subjective Norm	SN 1	My friends think I should use M-pesa.
	SN 2	My family/relatives think I should use M-pesa.
	SN 3	In general, people in my community support the use of M-pesa.
Self-efficacy	SE 1	I could probably only use M-pesa if I had seen someone else use it before.
	SE 2	I could probably only use M-pesa if I could call someone for help if I got stuck.
	SE 3	I could only use M-pesa if someone helped me get started.
Lost Performance	LP 1	I am scared of losing money if I use M-pesa.
	LP 2*	I don't think I will benefit much from using M-pesa.
	LP 3	I do not yet trust M-pesa.
Uncertainty Cost	UC 1	I am not sure what the level of service would be if I switched to using M-pesa.
	UC 2*	If I were to use M-pesa, the service I

		might receive could be worse than what I get now.
	UC 3	I am not sure that M-pesa works as well as my current way of sending and receiving money.
	UC 4*	I am not sure that M-pesa is as reliable as my current way of sending and receiving money.
	UC 5*	M-pesa is not much more convenient than my current way of sending and receiving money.
Post-switching Behavioural and Cognitive Cost	PSBC 1	Before I could properly use M-pesa, I would first have to spend a lot of time learning to do new things with my mobile phone.
	PSBC 2	Before I could properly use M-pesa, I would have to spend a lot of time learning how M-pesa works.
Sunk Cost	SCOST *	Overall, I have spent a lot of time and effort to learn how I can send and receive money without using M-pesa.
Setup Cost	SETCOST*	There would be much time and effort involved to start using M-pesa.
Intention to Use	INT 1	I intend to use M-pesa when next I need to send money.
	INT 2	I intend to use M-pesa when next I need to receive money.
	INT3	I will think about using M-pesa when next I need to send or receive money.

Note: None of the items measuring evaluation cost could be included in the pooled data because all items were revised for data collection in South Africa.

*indicates items dropped after PCFA (see Table 4.8, 4.9, 4.10)

4.4. Research Question 2

As mentioned in chapter one, the launch of M-pesa has been considered more successful in Kenya than in South Africa. This is evidenced by the varying rates of use across the two contexts. Within a span of two years, there were 8.6 million users in Kenya, whereas a year after its launch in South Africa, only 140,000 M-pesa users were reported. Therefore, the first objective of this study was to identify whether any differences exist in Kenyan and South African consumers' perceptions and attitudes towards M-pesa. To address this objective, selected factors were drawn from the TAM, TRA, SCT, and switching cost theory.

The rationale for the selection of these factors was based on the dominance of TAM and the confirmation by prior research of the strong explanatory power provided by the PU and PEOU variables (Venkatesh *et al.* 2003; Brown *et al.* 2008; Gallivan, 2001; Mathieson *et al.* 2001).

The importance of self-efficacy to less confident and anxious individuals about their ability to execute a given course of action, justifies its inclusion (McKee *et al.* 2006; Marakas *et al.* 2007). The role of subjective norms is an important predictor of behaviour where users operate in a community and are influenced by peers (Riemenschneider *et al.* 2003; Cheung *et al.* 2002).

Switching cost variables were necessary to incorporate in the model development because M-pesa is a relatively new product in the market and there are alternative services to it. Thus consumers would be challenged with a switching decision.

Each of the factors was measured using multi-item scales, therefore, prior to assessing the similarities and differences of Kenyan and South African consumer perceptions along each of these factors, the scales need to be examined to ensure validity and reliability. To accomplish this, a PCFA was run on a pooled dataset of responses from the two contexts.

4.4.1 Principal Component Factor Analysis

4.4.1.1 Pre- Factor Analysis

In order to carry out a factor analysis, a minimum sample size of 50 cases is required. However, over a 100 cases is ideal (Hair *et al.* 2006). Following the exclusion of outliers, a total of 411 (263- Kenya and 148-South Africa) usable responses were retained for the purpose of this analysis, making it appropriate for a factor analysis. A correlation matrix of

the 25 independent variable items on the pooled data was used to assess whether the variables were suitable for factor analysis[37]. The results showed that all of the correlations were greater than .30. Thus, none of the items were excluded.

4.4.1.2Principal Component Factor Analysis

This study adopted validated scales from prior published and cited works. However, given that adaptations were made to some of these scales, that this study is exploratory, and that validity issues are sample specific, it is necessary to revalidate the scales used in the study.

In order to achieve an optimal solution for factor loadings, varimax orthogonal rotation was used. This technique allows for maximization of the sum of variances of the squared loadings. With respect to this, Hair *et al.* (2006) suggest that items should be excluded in cases where: (i) they had low communality values of less than .50, (ii) their factor loadings were below .50, (iii) they cross loaded significantly above .50, or (iv) they loaded with items that are not related.

Several iterations were run in order to attain an optimal solution on the pooled data. Table 4.11 presents eliminated items and justifications for this action.

4.4.1.3 Analysis- Kenya and South Africa Samples

The factor analysis was run along theoretical lines. TAM and Extended TAM (i.e., from SCT and TRA) variables were assessed in the first factor analysis. A factor solution for a combination of the four independent variables (PU, PEOU, SN, SE) captured by 12 items, resulted in 4 factor loadings. Three of the four eigenvalues were greater than 1.0, collectively they accounted for 76.390% of the variance. All cross-loadings were resolved, and loadings were all above .50. The least factor loading was .658 (PEOU 1), while the highest was .934 (SN 2). See Table 4.8.

[37] Should any item have correlated at less than .30 it would have been excluded, as it reduces the factorability of the data and is not suitable for inclusion in a factor analysis (Hair et al. 1998).

Table 4.8 *Factor analysis of pooled data- Independent variables TAM and Extended TAM (SN & SE)*

Item	Factor			
	PU	PEOU	SN	SE
PU 1	.774			
PU 2	.839			
PU 3	.833			
PEOU 1		.658		
PEOU 2		.795		
PEOU 3		.834		
SN1			.880	
SN2			.934	
SN3			.742	
SE 1				.843
SE 2				.862
SE 3				.905

Notes: Extraction method: Principal Component Analysis
Rotation method: Varimax with Kaiser Normalisation. Rotation converged in 5 iterations
Kaiser–Meyer–Olkin measure of sampling adequacy: .808

The second factor analysis was conducted on the 8 items measuring the switching cost dimensions, and six items emerged as the final solution. Table 4.9 presents results of a 3 factor solution. One of the three eigenvalues was greater than 1.0, collectively the 3 factors accounted for 85.247% of the variance. The eigenvalues ranged from 3.619 (factor 1) to .556 (factor 3). There were no cross-loadings, and loadings were all above .50. The least factor loading was .757 (UCOST 1), while the highest was .905 (PSBC 1).

Table 4.9 *Factor analysis of pooled data- Independent variables Switching cost*

Item	Factor		
	LP	UCOST	PSBC
LP 1	.888		
LP 3	.846		
UCOST 1		.757	
UCOST 3		.832	
PSBC 1			.897
PSBC 2			.882

Notes: Extraction method: Principal Component Analysis
Rotation method: Varimax with Kaiser Normalisation. Rotation converged in 5 iterations
Kaiser–Meyer–Olkin measure of sampling adequacy: .794

To assess the dependent variable, a third PCFA was conducted. All three items for the dependent variable loaded as a single factor which explained 77.207% of the variance (See Table 4.10).

Table 4.10 *Factor Analysis of pooled data- Dependent Variable*

Item	Factor loading
INT 1	.916
INT 2	.923
INT 3	.792

Notes: Extraction method: Principal Component Analysis
Kaiser–Meyer–Olkin measure of sampling adequacy: .672

Subsequent to a factor analysis on the variable items, the following items were dropped during the iterations.

Table 4.11 *Items dropped during factor analysis- pooled data*

Construct	Number of original items	Number of retained items	Items eliminated	Justification for elimination
Uncertainty Cost	5	3	UCOST 2	Loaded on to an unlikely factor
			UCOST 4	Loaded on to an unlikely factor
			UCOST 5	Cross-loaded significantly above.5
Lost Performance	3	2	LP 2	Cross-loaded significantly above .5
Sunk Cost	1	0	SCOST	Cross-loaded significantly above .5
Setup Cost	1	0	SETCOST	Cross-loaded on multiple factors.

4.4.1.4 Pre validity and reliability measures

Cronbach's alpha was then used to measure the reliability of the scales. All scales had high reliability rates of over .70, which is appropriate (Nunnally, 1978). The scale with the least reliability value was .753, and the highest was .891. The Cronbach coefficient alpha's for the respective variables are presented in Table 4.12.

Table 4.12 *Validity and Reliability of Instrument*

Construct & Scale Items	Number of items	Factor loadings	Cronbach alpha	AVE	Square root of AVE	Mean	Standard Deviation
Intention to Use	3		.832	0.5	0.7	4.6	1.5
INT 1		.916					
INT 2		.923					
INT 3		.972					
Perceived Usefulness	3		.831	0.5	0.7	6.0	1.0
PU 1		.774					
PU 2		.839					
PU 3		.830					
Perceived Ease of Use	3		.761	0.5	0.7	5.7	1.1
PEOU 1		.658					
PEOU 2		.795					
PEOU 3		.834					
Subjective Norm	3		.864	0.7	0.8	5.0	1.6
SN 1		.880					
SN 2		.934					
SN 3		.742					
Self-Efficacy	3		.879	0.7	0.8	4.3	1.9
SE 1		.843					
SE 2		.862					
SE3		.905					
Lost Performance	2		.833	0.5	0.7	3.0	1.7
LP 1		.888					
LP 3		.846					
Post Switching Behavioural & Cognitive Cost	2		.891	0.5	0.7	3.9	1.8
PSBC 1		.897					
PSBC 2		.882					
Uncertainty Cost	2		.739	0.4	0.6	3.6	1.7
UCOST 1		.757					
UCOST 3		.832					

Notes: Average variance [38]extracted (AVE) used to assess convergent validity Square root (SQRT) of the AVE was used to assess discriminant validity

[38] The average variance extracted (AVE) for each variable was computed (cut off point >= .5) (Fornell & Larcker 1981). The AVE was measured according to the following formula, where λ_i is the loading of x_i on X, Var denotes variance, $_i$ is the measurement error of x_i, and Σ denotes a sum (Fornell & Larcker, 1981).

$$AVE = \frac{\Sigma[\lambda_{i2}]Var(X)}{\Sigma[\lambda_{i2}]Var(X)+\Sigma[Var(\ _i)]}$$

Satisfied as to reliability and validity, composite scores were calculated as the arithmetic average of a variables items that survived the PCFA. The Kenyan and South African respondents will be compared along these composite scores.
As can be seen, the Switching Cost dimension of pre-switching search and evaluation cost, sunk cost and setup cost have been eliminated and cannot be compared across Kenya and South Africa.

4.4.1.5 Testing for Normality

Normality is a major statistical supposition that should be validated. It looks at the degree to which the shape of a variable's data distribution fits with a normal distribution (Hair *et al.* 2006). In this study, for each variable, scatter plots were drawn to depict the shape of the distribution. The shape of data distribution is assessed by two measures: skewness and kurtosis (Hair *et al.* 2006 p.80)

Skewness results are used to measure the symmetry of a distribution, and a rule of thumb is that values outside the range of -1 to +1 suggest a considerably skewed distribution. However, Hair *et al*. (2006) caution that impacts of skewness is relative to sample size, and that a greater sample size could nullify the effects of skewness. In this study, it was realized that a number of cases lay outside the recommended skewness range (see Table 4.13 and Appendix E).

On the other hand, the kurtosis refers to the height of the data distribution in comparison to the normal distribution. The data set for this study had some kurtosis values that were outside the recommended -3 to +3 (Hair *et al.* 2006). See Table 4.13 and Appendix F.

Thus, given that some of the skewness and kurtosis values of the data were outside the recommended range, the researcher considered employing a non-parametric statistical method.

Consequently, to answer research question 2, the non-parametric Mann Whitney U-test was conducted to determine the differences in the perceptions and attitudes of Kenyan and South African consumers towards M-pesa. The results of the non-parametric Mann Whitney U-test are presented in Table 4.14

Table 4.13 *Descriptive statistics*

Final Factors	Range	Minimum	Maximum	Mean	Standard Deviation	Variance	Skewness		Kurtosis	
							Stat	Std. Error	Stat	Std. Error
(n=411)										
Intention to Use	6.00	1.00	7.00	4.6831	1.52317	2.320	-.384	.120	-.899	.240
Perceived Usefulness	5.67	1.33	7.00	6.0268	1.03178	1.065	-2.251	.120	6.188	.240
Perceived Ease of Use	6.00	1.00	7.00	5.7025	1.12162	1.258	-1.468	.120	2.317	.240
Subjective Norm	6.00	1.00	7.00	5.0973	1.68531	2.840	-.776	.120	-.618	.240
Self-efficacy	6.00	1.00	7.00	4.3059	1.91846	3.680	-.234	.120	-1.450	.240
Lost Performance	6.00	1.00	7.00	3.0234	1.76132	3.102	.463	.120	-1.164	.240
Uncertainty Cost	6.00	1.00	7.00	3.6789	1.74350	3.040	.332	.120	-1.300	.240
Post-Switching Behavioural and Cognitive Cost	6.00	1.00	7.00	3.9474	1.88667	3.560	.032	.120	1.209	.240

4.4.2 Comparison of Kenya and South African Samples

This section discusses the various techniques that were used for comparing the two samples.

4.4.2.1 Comparing Kenyan and South African Consumers on Demographic Factors

In order to provide some insights on the possible influence of age, income, gender, and education on intention to use M-pesa, the following tests were carried out.

A kruskal –Wallis test was conducted on the demographic (income, education, age) pooled data and adoption intention for both Kenya and South Africa to check for possible differences

in the effect of these demographics on consumer adoption intention. While an independent sample t-test was conducted on the gender variable and intention to use M-pesa.

4.4.2.1.1 Income

For Kenya, the results show that there is a significant effect of income on consumer intention to use M-pesa: χ^2 (5, N=260) = 31.520, p<.0005. Whereas, for the South African sample, there was no significant effect of income on consumer intention to use M-pesa: χ^2 (5, N=129) = 8.510, p>.0005.

4.4.2.1.2 Education

A Kruskal-Wallis test was carried out on the pooled data, to check if there was a significant effect of education on intention to use M-pesa.

For Kenya, there was a significant difference of education on intention to use M-pesa; χ^2 (7, N=262) = 57.000, p<.0005. Whereas, for South Africa, there was no significant effect of education on consumer intention to use M-pesa: χ^2 (7, N=145) = 6.149, p>.0005.

4.4.2.1.3 Gender

An independent sample T-test was conducted on the Kenyan data and South African data sets to see if there was a significant difference across genders towards intention to use.

In Kenya, there was no significant difference between males (M=4.2, SD=1.6) and females (M=4.4; SD=1.5); t=-.703, p>0.05. This indicates that gender does not have a significant effect on consumer intention to use M-pesa in Kenya.

Whilst in South Africa, there was a significant difference between males (M=5.4, SD= .89) and females (M=4.9, SD=1.5); t=2.336, p<0.05. This indicates that gender does have a significant effect on consumer intention to use M-pesa in South Africa.

4.4.2.1.4 Age

For the Kenyan data, the results show that there is no significant effect of age on consumer intention to use M-pesa: χ^2 (4, N=262) = 6.308, p>.0005. Also, for the South African data, there was no significant effect of age on consumer intention to use M-pesa: χ^2 (4, N=146) = 12.281, p>.0005.

4.4.2.2 Comparing Kenyan and South African Consumers on TAM and Switching Cost Variables

Table 4.14 and Appendix E show the results of the non-parametric Mann Whitney U-test conducted on the pooled data of Kenyan and South African respondents. It can be seen that there is a statistically significant difference between Kenyan and South African consumers' perceptions across each of the variables, and the level of significance is p<0.00 across all factors. Below are descriptive for each factor.

Table 4.14 *Mann Whitney U-test*

Mann Whitney U-Test				**Median**		**Z**	**Asymp.Sig. (2-tailed)**
Variable	**Context**	**N**	**Median**	**>Median**	**<=Median**		
		410					
PU	Kenya	263	6.3333	127	136	-6.372	.000
	South Africa	148		28	120		
PEOU	Kenya	263	6.0000	151	112	-7.459	.000
	South Africa	148		27	121		
SN	Kenya	263	5.6667	166	97	-7.351	.000
	South Africa	148		36	112		
SE	Kenya	263	4.6667	180	83	-12.488	.000
	South Africa	148		22	126		
LP	Kenya	263	2.5000	76	187	-10.805	.000
	South Africa	148		122	26		
UCOST	Kenya	263	3.5000	47	216	-14.043	.000
	South Africa	148		131	17		
PSBC	Kenya	263	4.0000	32	231	-12.397	.000
	South Africa	148		119	29		
INT	Kenya	263	5.0000	92	171	-5.576	.000
	South Africa	148		104	44		

Perceived usefulness had a median score of (MED=6.3). For the Kenyan sample, close to half (48.2%) of respondents ranked higher than the median score. Whilst in South Africa, most of the respondents (81%) ranked below the median score. These results suggest that while perceptions of the usefulness of M-pesa are evident in both contexts, the Kenyan respondents perceive the usefulness of M-pesa more than their counterparts in South Africa.

The median score for Perceived ease of use was (MED=6.0). A greater proportion of Kenyan respondents (57.4%) compared to the South African respondents (18.2%) ranked higher than the median score. This indicates that the Kenyan respondents have higher perceptions about the relative lack of effort involved in using M-pesa.

Perceptions of subjective norm as an influencer in the use of M-pesa were higher (63.1%) amongst the Kenyan respondents. The Majority of the South African respondents (74.6%) ranked below the median score (MED=5.6). This implies that Kenyan respondents perceive that the opinions of persons who matter to them are important when making a decision to use M-pesa than do the South Africans.

The Kenyan sample also had higher perceptions of self-efficacy (68.4%), ranking above the median score (MED=4.6), while most of the South Africans (84%) were below the median. These results indicate that Kenyan respondents have higher judgments of their ability to use M-pesa. (i.e., confidence is less of a barrier to Kenyans).

For perceptions of the switching cost dimensions, the South Africans ranked higher than the Kenyans. (i.e., they perceive greater levels of switching cost).

Perceptions of lost performance (MED=2.5) is perceived greater by the majority (81.3%) of the respondents in South Africa than in Kenya (28.8%). This suggests that the South African respondents perceive that they have a lot more to lose in switching to use M-pesa than do the Kenyan respondents.

For perceptions of uncertainty cost, a larger proportion of South African respondents (87.3%) ranked higher than the median score (MED=3.5) than Kenyans (29.3%). This suggests that the South African respondents are less convinced than the Kenyan respondents about the potential benefits that M-pesa has to offer.

Post-switching behavioural and cognitive cost (MED=4.0) is also perceived higher amongst the South African respondents (79.3%). Few Kenyans considered this cost (12.1%). This

implies that compared to the Kenyan respondents, South Africans believe that there is much more time involved in understanding how M-pesa works.

These results suggest that while the TAM and extended TAM variables are predictors of consumer intention to use M-pesa, switching cost dimensions are also critical in cases where consumers had alternative services. Given that in Kenya, M-pesa was the first financial service that was launched to cater to low-income consumer groups; these consumers may not have had to consider any of the costs associated with switching. However, in South Africa, there were prior alternatives to M-pesa, and these respondents could currently be users of such services, hence it is intuitive that they might perceive higher switching costs.

A point worth mentioning, and a dimension worth exploring is that amongst the Kenyan respondents, 97% are currently using the M-pesa service, and even though they were instructed to respond based on the pre-adoption perceptions towards M-pesa, it is likely that their responses reflect their experiences. This is very likely for their responses to perceived usefulness, perceived ease of use, and self-efficacy.

The Kenyan respondents may also have reported lower levels of switching costs, especially on post-switching behavioural and cognitive cost which implies again that M-pesa may be less complicated to use than initial pre-adoption perceptions might imply.

Nonetheless, there remains interest amongst South Africans in using M-pesa (M=5.2; SD=1.2), albeit with a good deal of variance.

Table 4.15 *Summary of the differences between the Kenyan and South African samples*

Factors	**Significant difference between Kenya and South Africa**	
Perceived Usefulness	Yes	Perceived greater in Kenya than in South Africa
Perceived Ease of Use	Yes	Perceived greater in Kenya than in South Africa
Subjective Norm	Yes	Perceived greater in Kenya than in South Africa
Self-Efficacy	Yes	Perceived greater in Kenya than in South Africa

Lost Performance	Yes	Perceived greater in South Africa than in Kenya
Uncertainty Cost	Yes	Perceived greater in South Africa than in Kenya
Post-Switching Behavioural and Cognitive Cost	Yes	Perceived greater in South Africa than in Kenya
Intention to Use	Yes	Perceived greater in South Africa than in Kenya

The next section answers research question 3, in an attempt to account for the variations in intention to use M-pesa amongst the South African consumers.

4.4.3 Research Question 3

4.4.3.1 Data Analysis- South African Sample

In order to adequately answer this question on the effects of the selected individual level factors on consumer intention to use M-pesa, the researcher decided to focus on the effects of these factors and test the model (fig 2.1) on the South African sample. This was necessitated for the following reasons: First, the survey instrument used in collecting data in Kenya was refined to enable better measurements of consumer intention to use M-pesa.

Second, from a practical viewpoint, the analysis of this sample helps in refining our understanding of consumer intention to use M-pesa in South Africa, given the expectations of future uptake of the service.

Third, from a theoretical standpoint, it is important to assess whether TAM and switching cost dimensions could be combined into one model and whether we can reliably measure the concepts from these two theories in the context of mobile technology-based service.

Fourth, because some of the switching cost dimensions were excluded from the pooled analysis.

The researcher begins with a PCFA of the improved South African questionnaire items. The results are reported in Table 4.16 below.

Table 4.16 *Factor analysis for Independent Variables- South African sample*

Factor	PU	PEOU	ECOST	LP	PSBC	SET	SUNK	UCOST	SE	SN
PU2	.844									
PU3	.892									
PU4	.684									
PEOU1		.860								
PEOU2		.833								
ECOST1			.656							
ECOST2			.771							
LP3				.723						
LP4				.719						
LP5				.818						
PSBC1					.784					
PSBC2					.871					
PSBC4					.584					
SETUP COST1						.698				
SETUP COST2						.657				
SETUP COST4						.840				
SETUP COST5						.767				
SUNK COST1							.746			
SUNK COST2							.874			
SUNK COST3							.784			
SUNK COST4							.803			
SUNK COST5							.747			
UNCERTAINTY COST3								.784		
UNCERTAINTY COST4								.670		
SE1									.863	
SE2									.799	
SE3									.881	
SN1										.877
SN2										.879
SN3										.856

Notes: Extraction method: Principal Component Analysis
Rotation method: Varimax with Kaiser Normalisation. Rotation converged in 7 iterations
Kaiser–Meyer–Olkin measure of sampling adequacy: .752

Table 4.17 *Factor Analysis for Dependent Variable (Intention to use) - South African sample*

Item	Factor loading
INT 1	.844
INT 2	.836
INT 3	.835
INT 4	.761

Notes: Extraction method: Principal Component Analysis

In this context, using improved measures, a better set of factor loadings emerged. A factor solution for a combination of the independent variables resulted in 30 items and 10 factors with identical correspondence to the 10 independent factors illustrated in figure 2.1. eigenvalues were greater than 1.0, collectively they accounted for 78.471% of the variance. Factor 1 had an eigenvalue of 7.194 and explained 21.158% of the variance in the variables. The eigenvalues ranged from 7.194 (factor 1) to 1.104 (factor 10). The total of the 10 eigenvalues was 78.471. The lowest communality value was .657 (SETCOST 1), and the highest was .905 (PU 3). This suggests a high common variance amongst the variables (Hair *et al.* 2006). All cross-loadings were resolved, and loadings were all above .50. The least factor loading was .596 (INT4), while the highest was .881 (SE 3). Factors comprised of 2-5 items. Subsequently, the emerged factors were labelled accordingly.

For the dependent variable, the same procedures were followed. The four items measuring the dependent variable loaded as a single factor. Only one component was extracted, thus rotation was not required. The component had an eigenvalue of 2.687 and explained 67.181% of the variance. Also the Bartlett's test of sphericity was statistically significant (df=6; p=.000). On the whole, the MSA was .763, which exceeds the minimum value (0.50) suggested by Hair *et al.* (2006). The communality values were (.712, .698, .698, .579) respectively, and the factor loadings were (.844, .836, .835, .761).

Table 4.18 *Items dropped during factor analysis- South African sample*

Construct	Number of original items	Number of retained items	Items eliminated	Justification for elimination
Perceived Usefulness	5	4	PU 1	Cross- loaded unto an unlikely factor
Perceived Ease of Use	3	2	PEOU 3	Cross- loaded unto an unlikely factor
Evaluation Cost	3	2	E COST 2	Cross-loaded unto an unlikely factor.
Lost Performance	5	3	LP 1	Low factor loadings and under an unlikely factor
			LP 2	Low factor loadings and under an unlikely factor
Uncertainty Cost	5	2	U COST 1	Low factor loading (below.5)
			U COST 2	Cross loaded unto an unlikely factor
			U COST 5	Cross-loaded unto an unlikely factor
Post-switching Behavioural Cost	5	3	PSBC 3	Low factor loading and cross-loaded unto an unlikely factor
			PSBC 5	Low factor loading and cross-loaded unto an unlikely factor
Setup Cost	5	4	SETCOST 3	Loaded unto an unlikely factor

4.4.3.2 Pre-validity and reliability measures

Results of the final solution show that all items measuring each construct had high loadings on single factors, as all the loadings were above .50. In addition, no cross-loadings remained. The results displayed in Table 4.19, show that there is acceptable discriminant and convergent validity.

Cronbach's alpha was then used to measure the reliability of the scales. All scales, except one, had high reliability rates of over .70, which is the acceptable value (Nunnally, 1978). The exception had a reliability score below .7 (Ecost- 0.576). Therefore, the researcher decided to drop this construct. The remaining scales had reliability scores of between .745,

and .937. The Cronbach coefficient alpha's for the respective variables are presented in Table 4.19.

Composite scores were calculated for each factor, and the average score of the items loading were higher than 0.5 on each factor. In total 11 composite scores were created – 10 for the independent variables and 1 for the dependent variable.

Table 4.19 *Validity and Reliability of Instrument- South African sample*

Construct & Scale Items	Number of items	Factor loadings	Cronbach alpha	AVE	Square root of AVE	Mean	Standard Deviation
Intention to Use	4		.836	0.6	0.8	5.2	1.1
INT 1		.844					
INT 2		.836					
INT 3		.835					
INT 4		.761					
Perceived Usefulness	3		.850	0.6	0.8	5.6	1.2
PU 2		.844					
PU 3		.892					
PU4		.684					
Perceived Ease of Use	2		.870	0.4	0.6	5.2	1.3
PEOU 1		.860					
PEOU 2		.833					
Post Switching Behavioural and Cognitive Cost	3		.832	0.5	0.7	5.3	1.5
PSBC 1		.784					
PSBC 2		.871					
PSBC 4		.584					
Lost Performance	3		.768	0.5	0.7	4.2	1.4
LP 3		.723					
LP 4		.719					
LP 5		.818					
Setup Cost	4		.825	0.6	0.7	4.6	1.2
SETCOST1		.698					
SETCOST2		.657					
SETCOST4		.840					
SETCOST5		.767					

Uncertainty Cost	2		.745	0.3	0.5	5.2	1.3
UCOST 3		.784					
UCOST 4		.670					
Sunk Cost	5		.884	0.7	0.8	5.5	1.4
SUNK 1		.746					
SUNK 2		.874					
SUNK 3		.784					
SUNK 4		.803					
SUNK 5		.747					
Subjective Norm			.922	0.7	0.8	4.3	1.7
SN 1		.877					
SN 2		.879					
SN 3		.856					
Self-efficacy	3		.856	0.7	0.8	5.3	1.5
SE 1		.863					
SE 2		.799					
SE 3		.881					

Notes: Average variance [39]extracted (AVE) used to assess convergent validity
Square root (SQRT) of the AVE was used to assess discriminant validity

4.4.3.3 Hypotheses Test

Given that the above factors were valid and reliable, it was deemed appropriate to proceed to calculate composite scores for each variable as the arithmetic average of each of their items weighted equally. These would then be used in correlation analysis that would precede the use of PLS regression for the model testing and also the revised model testing.

Pearson's correlation was calculated for the sample data. Relationships would be considered statistically significant if they correlate at a significant level of $p < 0.01$. The results are shown in Table 4.20.

The correlation outcome between the dependent variable and the independent variables were as follows; four variables were statistically significant at $p<0.05$, while five variables were not statistically significant.

'Perceived usefulness and intention to use', and also 'perceived ease of use and intention to use' are positively correlated, and this indicates that hypothesis 1 and 2 might be supported.

[39] The average variance extracted (AVE) for each variable was computed (cut off point >= .5) (Fornell & Larcker, 1981). The AVE was measured according to the following formula, where λ_i is the loading of x_i on X, Var denotes variance, $_i$ is the measurement error of x_i, and Σ denotes a sum (Fornell & Larcker ,1981).

$$AVE = \frac{\Sigma[\lambda_{i2}]Var(X)}{\Sigma[\lambda_{i2}]Var(X)+\Sigma[Var(\ _i)]}$$

Secondly, lost performance and intention to use are negatively correlated, which also provides an indicator that hypothesis 6 could be supported.

Thirdly, subjective norm and intention to use are positively correlated, which could hold up hypothesis 3.

The other variables (post-switching behavioural and cognitive cost, setup cost, self-efficacy, sunk cost, and uncertainty cost) are not statistically significantly correlated with intention to use.

Table 4.20 Pearson's *Correlation Analysis- South African sample*

Correlation Analysis											
		Perceived Usefulness	**Perceived Ease of Use**	**Lost Performance**	**Post-Switching behavioural & Cognitive Cost**	**Setup Cost**	**Self-efficacy**	**Subjective Norm**	**Sunk Cost**	**Uncertainty Cost**	**Intention to use**
Perceived Usefulness	Pearson Correlation	1	.420	-.257**	.130	.019	.146	.370**	.133	.104	.438**
	Sig. (2-tailed)		.000	.001	.114	.814	.074	.000	.106	.204	.000
	N	150	150	150	150	150	150	150	150	150	150
Perceived Ease of Use	Pearson Correlation	.420	1	-.198*	.113	-.003	.014	.338	.197	.088	.421**
	Sig. (2-tailed)	.000		.015	.168	.974	.863	.000	.016	.282	.000
	N	150	150	150	150	150	150	150	150	150	150
Lost Performance	Pearson Correlation	-.257**	-.198*	1	.309**	.386**	.047	-.190*	.261**	.392**	-.231**
	Sig. (2-tailed)	.001	.015		.000	.000	.569	.020	.001	.000	.004
	N	150	150	150	150	150	150	150	150	150	150
Post-Switching Behavioural & Cognitive Cost	Pearson Correlation	.130	.113	.309**	1	.441**	310**	-.033**	.482**	.390**	.083
	Sig. (2-tailed)	.114	.168	.000		.000	.000	.690	.000	.000	.314
	N	150	150	150	150	150	150	150	150	150	150
Setup Cost	Pearson Correlation	.019	-.003	.386**	.441**	1	.386**	.059	.374**	.447**	.121
	Sig. (2-tailed)	.814	.974	.000	.000		.000	.474	.000	.000	.140
	N	150	150	150	150	150	150	150	150	150	150
Self-efficacy	Pearson Correlation	.146	.014	.047	.310**	.386**	1	-.019	.155	.244**	.144
	Sig. (2-tailed)	.074	.863	.569	.000	.000		.816	.058	.003	.078
	N	150	150	150	150	150	150	150	150	150	150
Subjective Norm	Pearson Correlation	.370**	.338**	-.190*	-.033	.059	-.019	1	.253**	-.053	.447**
	Sig. (2-tailed)	.000	.000	.020	.690	.474	.816		.002	.520	.000
	N	150	150	150	150	150	150	150	150	150	150
Sunk Cost	Pearson Correlation	.133	.197	.261**	.482**	.374**	.155	.253**	1	.364	.105
	Sig. (2-tailed)	.106	0.16	.001	.000	.000	.058	.002		.000	.200
	N	150	150	150	150	150	150	150	150	150	150
Uncertainty Cost	Pearson Correlation	.104	.088	.392**	.390**	.447**	.244**	-.053	.364**	1	.101
	Sig. (2-tailed)	.204	.282	.000	.000	.000	.003	.520	.000		.218
	N	150	150	150	150	150	150	150	150	150	150
Intention to Use	Pearson Correlation	.438**	.421**	-.231**	.083	.121	.144	.447**	.105	.101	1
	Sig. (2-tailed)	.000	.000	.004	.314	.140	.078	.000	.200	.218	
	N	150	150	150	150	150	150	150	150	150	150

Notes **Correlation is significant at the 0.01 level (2-tailed)
***Correlation is significant at the 0.05 level (2-tailed)**

The correlation matrix above shows that there are some significant relationships amongst the variables. However, there were only four significant relationships between the independent variables and the dependent variable. As a result, the researcher decided to conduct a regression test on only these variables.

4.4.3.4 Regression using composites

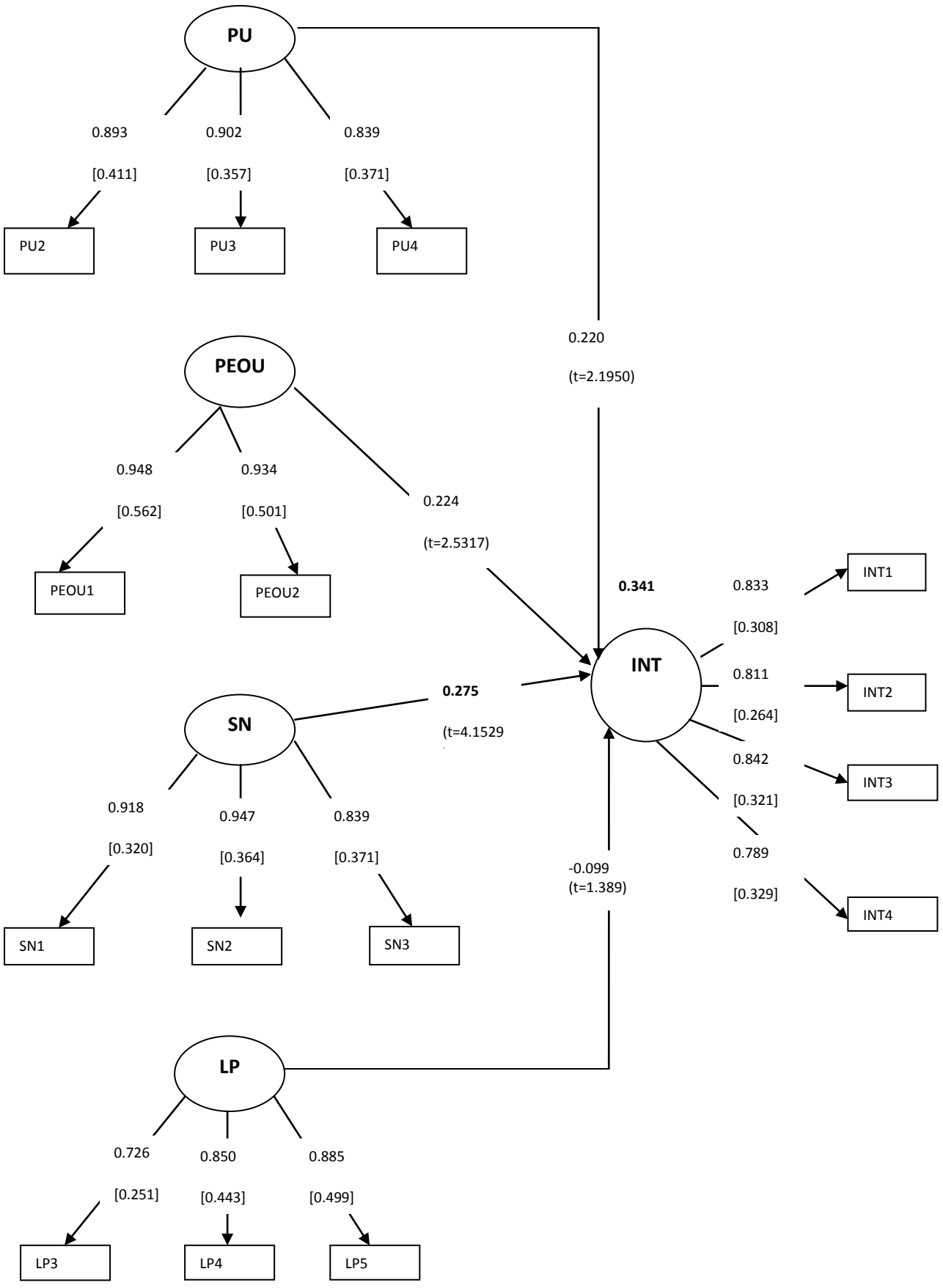
A regression analysis using partial least squares (PLS) graph was run on the factors that had significant correlations with the dependent variable. This analysis helps to assess the relative contribution of each predictor variable on the dependent variable by enabling the researcher uncover the impact of each independent variable in predicting the dependent variable.

Given the sample size of 150 for this context, a regression analysis was viable (Hair *et al.* 2006). Table 4.21 presents results of an initial regression using composite scores. It shows significant effects of PU, PEOU, SN but not LP. A more sophisticated analysis combining both a measurement and structural model is shown in Figure 4.1. Figure 4.1 illustrates a significant model explaining 34.1% of the variance.

Table 4.21 *Path coefficient for composites*

Dependent -	**INT**	**PU**	**PEOU**	**SN**	**LP**
Sample Estimate	*INT*	0.2200	0.2240	0.2750	-0.0990
Mean of Subsamples	*INT*	0.2225	0.2364	0.2682	-0.1075
Standard Error	*INT*	0.1077	0.0846	0.0803	0.0678
T-Statistics	*INT*	2.0419	2.6482	3.4228	1.4605
R^2=33.1%					

Fig 4.1 PLS GRAPH- Individual items per construct



T-values for determining the significance of the path coefficients in Figure 4.1 were derived from PLS bootstrapping method. This method used 100 re-samples to calculate standard errors and t-values. Paths are significant at an alpha of 0.5 if t-values are above 1.96. The results show that both analysis of composites scores and analysis of the model using individual items reveal that:

SN emerged with a significant path coefficient, and it was the strongest predictor variable of intention to use M-pesa.

PEOU emerged with the second strongest significant path coefficient, which means that while consumer perceptions of usefulness influences their intention to use M-pesa, its importance is felt only after their perception of ease of use of M-pesa.

PU had the third strongest significant path coefficient and this finding is in accordance with the literature that an individual will use a technology-based service if they perceive it to be useful.

LP emerged with the least path coefficient, and it was insignificant. This means that in the presence of other factors its impact on intention to use M-pesa is insignificant.

4.4.7.4.3 Hypotheses Supported

H1- Perceived Usefulness of M-pesa will have a positive effect on an individual consumer's intention to use.

H2- Perceived ease of use of M-pesa will have a positive effect on an individual consumer's intention to use.

H3: Subjective norm will have a positive effect on an individual consumer's intention to use M-pesa.

As shown above, three of this study's hypotheses were supported. This shows that the factors (Perceived Usefulness, Perceived Ease of Use, and Subjective Norm) are strong factors in predicting consumer intention to use a mobile based-technology product in Africa.

The two factors (PU and PEOU) from the TAM, and SN factor from the TRA, were significant predictors of consumer intention to use M-pesa. Interestingly, the self-efficacy factor from SCT was not a significant determinant of intention to use M-pesa. This is possibly due to reports in the literature (Brown, 2002; Venkatesh, 2000) that suggest that SE

impacts PEOU, which in turn influences intentions to use. Thus, its impact might be mediated.

For the switching cost dimensions, given that only one factor had a significant correlation with intention to use, but the others did not, it may be that: (a) the effect of these factors on intention to use M-pesa are moderated by other variables, or (b) they serve as moderating rather than direct effect variables. Further explanations for these results will be offered in the next chapter.

4.4.7.4.4 Significance of this study's findings

The relatively low R^2 of 33.1% in this study is consistent with findings by Kim *et al.* (2007) R^2 of 35.9 and Meso *et al.* (2005) R^2 of 38.4, who have also investigated individual consumer intention to use mobile technology-based applications/services. It would have been interesting to compare the R^2 realized in this study to those of Mbogo (2010) and Tobbin & Kuwornu (2011), who investigated intentions to use M-pesa in African countries. But unfortunately, R-squares were not reported in these studies.

The findings of this study and those of other work in this area suggest that existing theories in assessing technology acceptance amongst individual consumers do not account for the majority of observed variance and the development of better theories is required.

Additional information

For illustrative purposes, and in order to test how the model responded for the Kenyan data set (i.e., predominantly users), similar to analysis of the South African data, an analysis of the Kenyan data was conducted. Given that the majority of the Kenyan respondents were users, the switching cost dimensions were omitted and the focus was on the effects of PU, PEOU, SN, SE on INT. Results are reported in Appendix H.

The results suggest that the model was a better predictor of intentions to use in the South African context.

4.5 Chapter Conclusion

In order to answer research question 2 and 3, two data sets were analysed in this chapter. The first was on a pooled data total of 411 (263- Kenya and 148- South Africa), and the other was on 150 responses of the South African sample.

Data screening and validity and reliability tests were carried out on each data set. To answer research question 2, descriptive statistics on the pooled data set were presented. Subsequently, to answer research question 3, the South African data set was analysed. The proposed hypotheses were tested and the results presented. A summary of the results of the hypotheses can be seen below in Table 4.22.

In the next chapter, results will be discussed in the light of the literature presented in chapter 2.

Table 4.22 *Summary of findings*

Hypotheses	**Description**	**South African data only**
H1	Perceived Usefulness of M-pesa will have a positive effect on an individual consumer's intention to use.	Hypothesis supported
H2	Perceived ease of use of M-pesa will have a positive effect on an individual consumer's intention to use.	Hypothesis supported
H3	Subjective norm will have a positive effect on an individual consumer's intention to use M-pesa.	Hypothesis supported
H4	A high perception of self-efficacy will have a positive effect on an individual consumer's intention to use M-pesa.	Hypothesis not supported
H5	Perceived high pre-switching search and evaluation cost will have a negative effect on an individual consumer's intention to use M-pesa.	Hypothesis not supported
H6	A high perception of lost performance will have a negative effect on an individual consumer's intention to use M-pesa.	Hypothesis not supported
H7	A high perception of post-switching behavioural and cognitive costs will have a negative effect on an individual consumer's intention to use M-pesa.	Hypothesis not supported

H8	A high perception of sunk cost will have a negative effect on an individual consumer's intention to use M-pesa.	Hypothesis not supported
H9	A high perception of setup cost will have a negative effect on an individual consumer's intention to use M-pesa.	Hypothesis not supported
H10	A high perception of uncertainty cost will have a negative effect on an individual consumer's intention to use M-pesa.	Hypothesis not supported

Chapter 5- Discussions and Interpretations

5.1 Chapter Introduction

The previous chapter presented results of the data collected, and answered research questions 2 and 3. It investigated the factors that affect consumer intention to use M-pesa, and also highlighted differences between consumer perceptions towards M-pesa in Kenya and South Africa. A number of interesting observations were made, and are discussed below.

Firstly, results relating to research question two- the extent to which factors drawn from TAM, TRA, SCT, and Switching Cost and consumer intention to use differ across Kenya and South Africa are discussed.

Thereafter, results relating to research question three -testing the hypothesized effects of TAM, TRA, SCT and Switching Cost variables on the South African consumer's intention to use M-pesa will be discussed. Each of these discussions will reflect on the literature reviewed in Chapter 2. Based on the findings, a model to guide future research is presented.

5.2 Research Question 2

To what extent do Kenyan and South African consumers differ in their intentions to use M-pesa and in their perceptions of the individual level factors identified by research question 1?

First to be discussed are the differences between the Kenyan and South African consumers in their current levels of M-pesa use. Significantly more Kenyans (almost all in that sample) have already adopted and used M-pesa at least once, with a majority having used it quite regularly. This finding is interesting, and it suggests that there is a wide spread use of M-pesa amongst individuals in low-income communities in Kenya. Despite the products launch in South Africa one and a half years ago, only seven point three percent of a sample of the targeted user population (lower-income individuals) have adopted the product and are currently using it. This suggests that there is an interesting question surrounding the success of the service in South Africa and the current low levels of use may partly reflect that most of the South African respondents have bank accounts.

Consumers in the two contexts were also probed regarding their desire to use M-pesa as opposed to other available services / methods of transacting when they next needed to send or receive money. This was termed "intention to use". The findings firstly confirmed that a

consumer's intention to use M-pesa could be reliably captured as an aggregate of their intention to use it for sending money as well as receiving money. Secondly, the results showed that intention to use M-pesa amongst individuals' in South Africa were stronger than those of Kenyans. This is very interesting because only a few of the respondents in South Africa had used M-pesa previously, and a majority of them had never used it. This suggests that despite the low current levels of use, the South African respondents have a keen interest to use M-pesa in the near future. As suggested by Camner *et al.* (2009), individuals' who are financially literate are more likely than those who are not financially literate to appreciate the benefits of a service such as M-pesa. Financial literacy may be higher in South Africa than Kenyan evidence by average bank account ownership in South Africa standing at sixty-three percent (Payne, 2011) and twenty-two point six percent in Kenya (Finscope, 2011). Thus, even though most South Africans have not used M-pesa, their level of financial literacy enlightens them on the relative benefits of M-pesa. This may suggest that despite low current use, South Africans still view the M-pesa service as having some perceived advantages and interesting questions are raised regarding the factors that might underlie the intentions to use M-pesa and switch from their existing services.

Kenyan and South African consumers were probed regarding their perceptions along a number of factors drawn from TAM, TRA, SCT, and Switching Cost theories. Differences in perceptions across the two groups were examined. First, differences regarding the TAM variables are explored, and then differences, regarding the SCT and TRA variables are explored, finally the Switching Cost variables are considered.

Perceived Usefulness and Perceived Ease of Use

Based on the descriptive results presented in chapter four, Kenyans showed a higher level of perception towards the perceived usefulness of M-pesa.

Given the higher financial literacy rates amongst the South African consumers, it was expected that they would perceive the benefits of M-pesa. Interestingly however, the Kenyans perceived significantly greater benefits arising from the service's use. These perceptions could result from the limited and risky money transfer options that were available for them, as there was no prior licensed financial service that catered to this consumer group. Thus, when M-pesa (a licensed financial service) was introduced, they opted for it. This finding supports the TAM's postulation on perceived usefulness; that an individual will opt for a

technology- based service if they believe that it would enhance their task performance (Davis, 1989). The task performance here being money transfer, and given that M-pesa is a more enhanced service than the options that were previously available to Kenyans, their decision to use it concurs with the TAM's position. Whereas in South Africa, there were financial services catering for the low-income communities, prior to the introduction of M-pesa. Thus, while South Africans may perceive M-pesa as useful, their perception of its usefulness to enhance their task performance of money transfer may not be as strong as those of Kenyans because majority of them are currently serviced by licensed financial services. It is therefore understandable to see that South African's perception of usefulness is lower than those of Kenyans.

Perceived ease of use is another variable drawn from TAM, and has been also been supported in several (e.g. Davis *et al*. 1989; Agarwal & Prasad, 1997; Jackson *et al.* 1997; Venkatesh & Morris, 2000) technology adoption studies.

A comparison of the two samples showed that Kenyans indicated higher levels of ease of use of M-pesa. This result differs from the researchers expectation, but is nonetheless, very interesting. This is because, given that M-pesa is operated on a mobile technology-based platform, and that mobile penetration in South Africa stands at eighty five percent (Chigona, *et al.* 2009), while Kenya stands at forty five percent (CCK, 2009), it would have been expected that perceptions of M-pesa ease of use would be higher in South Africa than in Kenya. Thus, a possible reason for this finding may be that, majority of the Kenyan respondents were already M-pesa users, and although they were instructed to respond to the questionnaire items based on their pre-adoption perceptions, their responses may have filtered through their experiences with using M-pesa. If this is the case then the findings are encouraging i.e. perceptions regarding the ease of use of the service will increase over time as it is more frequently used. The extent to which South African's relatively lower perceptions of ease of use are impacting their adoption decisions is discussed later in this chapter.

Subjective Norms and Self-efficacy

Subjective norm and self-efficacy are both factors from social psychology theories. The difference in perceptions towards subjective norm was higher in Kenya than in South Africa. The researcher had no context specific expectation on this variable. However, based on the researchers postulation that an individual is more likely to use a technology-based service if the people who matter to him/her support the use of it, a possible reason for the stronger

perception of subjective norm in Kenya is that there was no prior alternative to M-pesa, and when M-pesa was made available, breadwinners who had migrated to the urban areas or those who reside there, supported the service because it facilitated their transfer of money to their dependents. While in South Africa, there were previously available money transfer options, thus endorsement of a similar new product (M-pesa) by persons important to respondents may not have taken place.

Self-efficacy in this study measured an individual's self-reported ability to use M-pesa. Again, individuals' in Kenya reported higher perceptions of their abilities than South Africans to use M-pesa. This result is contradictory to the researcher's expectation that the higher rate of mobile use in South Africa compared to Kenya will impact an individual's self-confidence to use M-pesa. Thus, again, a possible reason for this result is that majority of the Kenyan respondents are currently users of M-pesa, and may have based their responses on their experiences. With greater use, comes greater confidence for repeated use.

Switching Costs

The switching cost dimensions adopted in this study were drawn from literature on consumer behaviour. However, only three dimensions (lost performance, post-switching behavioural and cognitive costs, and uncertainty cost) could be reliably measured and compared across the two contexts.

Following a comparative analysis of switching cost perceptions in both contexts, the results showed that perceptions of switching costs are higher amongst the South African sample than the Kenyan sample. Explanations of the results on each switch cost dimension will be discussed below.

Given that no prior studies were found to have applied switching cost in predicting consumer intention to use a mobile technology-based service, the findings of this exploratory study serve to provide a platform on which future studies may build on.

South African respondents reported higher perceptions of lost performance. This finding implies that South Africans perceive that they have a lot more to lose by switching to use M-pesa, than do the Kenyans. Given that majority of the respondents in both context reported having bank accounts, it suggests that the South African respondents perceive that they are afforded more benefits by their current financial service providers than do the Kenyan

respondents. In addition, it indicates that M-pesa service providers have not been forth-coming in convincing prospective users on the benefits they would stand to gain over what their current service providers are offering.

Respondents in South Africa also perceive significantly higher post-switching behavioural and cognitive cost compared to the Kenyan sample. The implication of this finding is that South Africans are less convinced that it will take little time to master the use of M-pesa. This perceptions also suggest that the M-pesa service providers in South Africa have not been successful in convincing prospective users on the relatively little time it could take to become familiar with the M-pesa service.

Reflecting on suggestions by Camner *et al.* (2009) that the technology platform used in Kenya -STK is much easier to use, than the USSD platform, which is used in South Africa, it could be that majority of the South African respondents believe that they require more information to use M-pesa. The onus now rests on M-pesa service provider in South Africa to convince prospective users that the use of M-pesa does not require much effort and time to get familiar with.

The literature suggests that when switching from a familiar service to an unfamiliar one, feelings of uncertainty may arise (Whitten & Wakefield, 2006). Given that the M-pesa service is a unique mobile based-technology service, perceptions of uncertainty cost in both contexts does not come as a surprise. Prior to the launch of M-pesa, there was no identical service in both contexts. South African respondents reported higher perceptions of uncertainty costs than the Kenyan respondents. This result indicates that the M-pesa service providers in South Africa have again not been successful at providing consumers with sufficient information on M-pesa, or have not been forthcoming in convincing them on the benefits of using M-pesa. On the other hand, the service provider in Kenya seems to have done a better job, as consumers are less uncertain about the services M-pesa has to offer.

5.3 Research Question 3

What are the effects of the selected individual level factors on South African consumers' intentions to use M-pesa?

In an effort to answer the above research question, a research model was developed based on four theories (TAM, TRA, SCT, and Switching Costs). Following improvements to the measurement scales for the variables used in the Kenyan data collection process, the data to test the model in the South African context was collected. Examining the model within the South African context was particularly important given that adoption has been slow and there is an important need to understand variations in consumer intention to use the service. Results pertaining to each of the hypotheses in the research model are discussed next.

H1*- Perceived usefulness of M-pesa will have a positive effect on an individual consumer's intention to use.*

Hypothesis 1 was supported. The predictive power of TAM has once again been confirmed in this study. TAM has been cited in excess of a thousand times (Brown *et al.* 2008 p.5) and was thus an important underpinning for this work. According to TAM, the perceived usefulness of a technology-based product/service is reflected by an individual's belief that the technology facilitates their task performance (Davis, 1989), should lead to usage intentions. This has been confirmed now in the context of South African consumers and their intentions toward the use of M-pesa.

H2- *Perceived ease of use of M-pesa will have a positive effect on an individual consumer's intention to use.*

Hypothesis 2, which is also part of TAM theory, was supported. Moreover, perceived ease of use was found to have the strongest direct influence on intention to use M-pesa. This finding is interesting because South African consumers have not yet adopted M-pesa, and they are still in the early stages of forming opinions about this technology-enabled service. This observation relates to Brown's (2002) study on determinants of information technology adoption and use, where he suggested that consumers at the early adoption stages may initially be more concerned with ease of use rather than usefulness. In later stages of adoption, ease of use becomes less important and the need for benefits to be derived becomes a greater determinant of intentions - which is why perceived usefulness has been found to be

a better predictor of usage intentions in the later stages of a technology's adoption (Hernandez *et al.*, 2008; Karahanna *et al.* 1999).

H3: *Subjective norm will have a positive effect on an individual consumer's intention to use M-pesa.*

Hypothesis 3 was supported. The impact of subjective norm on consumer intention to use M-pesa was found to be a direct one. Subjective norm refers to an individual's belief that the majority of the people whose opinions matter to them are of the view that they should engage in certain behaviour (Fishbein & Ajzen, 1975), and according to TRA, it influences behavioural intention to use.

Although the literature (Schepers & Wetzel, 2007) has noted that the influence of subjective norm on technology use can vary across consumer contexts, its impact was significant in the South African context. This finding, although without direct suggestions in the reviewed literature, may be explained by the majority of male respondents amongst the sample. The literature by Cheung *et al.* (2002) found that the relationship between subjective norm for males was stronger than those of females. This finding could indicate that technology use by males is higher influenced by subjective norm. Thus, this study's finding is consistent with past studies (Igbaria *et al.* 1997; Cheung *et al.* 2002; Riemenschneider *et al.* 2003) that found subjective norm to be an influencer of intention to use.

H4- *A high perception of Self-efficacy will have a positive effect on an individual consumer's intention to use M-pesa.*

Hypothesis 4 was rejected. The results showed that self-efficacy does not have a direct effect on consumer intention to use M-pesa. Self-efficacy is 'ones judgment' of their ability to manage actions required to attain a specific performance (Bandura, 1994) and according to SCT, increased self-efficacy should result in a higher level of endurance when faced with challenging tasks.

Brown (2002) and Venkatesh (2000) however report that the effect of self-efficacy is sometimes mediated by perceived ease of use, which in turn directly influences intention to use. This is because an individual's perception of their ability to manage a certain situation is often based on prior experience. Thus, their assessment based on previous experiences is vital in shaping their perceptions of ease of use over time. However, other studies such as (McKee *et al.* 2006); suggest that in certain contexts such as the service industry, self-efficacy may

have direct effects. This concept is based on the view that individuals' learn by observation, and result patterns of others, without a need to participate in situations themselves. Given that M-pesa is part of the service industry, it was thus important to test a direct effect hypothesis. The rejection of a direct effect of self-efficacy on intention in this context implies that the South African respondents may not base their learning patterns by simply observing but they may require an actual experience.

H5- *Perceived high pre-switching search and evaluation cost will have a negative effect on an individual consumer's intention to use M-pesa.*

Hypothesis 5 was not supported. This variable was dropped from the study. Further research needs to refine its measures. It should however be noted that in Jones *et al.* (2002), there was no formal basis for predicting evaluation costs and intentions. Thus, further effort is needed to understand the relevance of this cost to consumers.

H6 *A high perception of lost performance will have a negative effect on an individual consumer's intention to use M-pesa.*

Hypothesis 6 is rejected. This is the only dimension of switching cost that had a statistically significant and negative correlation with intention to use M-pesa; however, it did not have a direct effect on intention to use in the presence of the other variables within the PLS model. This finding is consistent with those of Jones *et al.* (2002), who posited and found that lost performance correlates more strongly with intentions than any other switching cost dimension. The finding of its statistically significant negative correlation with intention to use M-pesa is in line with expectations of the researcher. Given that lost performance is the tangible and intangible benefits that an individual would have accrued as a customer (Turnball and Wilson, 1989; and Gwinner *et al.*1998), and that majority of the respondents in South Africa are currently customers of financial services, it was expected that these consumers might have perceptions of losses arising from a switch to a new financial service provider.

H7- *A high perception of post-switching behavioural and cognitive cost will have a negative effect on an individual consumer's intention to use M-pesa.*

Hypothesis 7 was rejected. This switching cost dimension did not emerge as a direct determinant of intention to use. It was hypothesized that even post-adoption consumers actually need time to learn and spend time to feel comfortable with a new service or product (Jones *et al.* 2002), and that they would perceive these learning costs as an additional set of switching costs that would negatively impact usage intention. No effect was however found. This result suggests that respondents' prior exposure and experience with alternative financial services could have diluted the effect of this cost.

H8- *A high perception of sunk cost will have a negative effect on an individual consumer's intention to use M-pesa.*

Hypothesis 8 is rejected. Sunk cost was not found to be an insignificant predictor of consumer intention to use M-pesa. This finding is consistent with results of Jones *et al.* (2002) and Whitten & Wakefield (2006), where sunk cost was not a direct influencer of the dependent variables that were examined. These studies also expected the impact of sunk cost to be realized because it is a key dimension in measuring switching cost. Nonetheless, given that this study was exploratory, its consistent findings with this cited literature may suggest that that the effect of sunk cost is not as important as other switching cost variables. Also, a possible reason for this result is that the use of M-pesa does not require an individual to end their relationship with their current financial service provider. Thus, respondents may not have considered strongly that they would forfeit gains attached to their time, effort, energy, and money invested with their current financial service.

H9 *A high perception of setup cost will have a negative effect on an individual consumer's intention to use M-pesa.*

Hypothesis 9 was rejected. This hypothesis could not be confirmed in this study, because perceptions of setup costs did not have a direct impact on consumer intention to use M-pesa. Drawing on marketing and IS literatures (Jones *et al.* 2002; Whitten & Wakefield, 2006), it was initially hypothesized that perceptions of high setup costs would lead to decreased intentions to use because a more expensive setup cost would not elicit positive attitudes towards intention to use. This study's finding of no effect is somewhat consistent with prior work (Jones *et al.* 2002; Whitten & Wakefield, 2006), finding no direct effect. The

hypothesis in this study was rejected, suggesting that consumers may not be considering setup costs when making a decision to use M-pesa or these perceptions play a moderating role.

H10- *A high perception of uncertainty cost will have a negative effect on an individual consumer's intention to use M-pesa.*

Hypothesis 10 was rejected. The result shows that respondents' perceptions of uncertainty cost did not have a direct impact on consumer intention to use M-pesa. It was initially hypothesized that this would be the case because study by Jones *et al.* (2002) reported a similar relationship, while Whitten & Wakefield (2006) found an association, and suggested a possible influence of the variable. The decision to test a direct relationship in this study was made because one of the contexts (financial service) examined by Jones *et al.* (2002) was similar to this study's context, and reported a relationship. It is therefore surprising that in this study's context, the relationship did not hold. The role of uncertainty costs requires further explanation by future studies.

5.4 Discussion of the theoretical underpinnings of the work

Variables from four theories were adopted to develop the research model addressed in research question 3. These theories were the TAM, TRA, SCT, and Switching Costs.

The results presented in the previous section indicate that not all the theories were successful in contributing to the prediction of consumer intention to use M-pesa.

The TAM, which has been cited in excess of over a thousand times (Brown *et al.* 2008), emerged as the theory with the strongest influence. This theory takes the perspective that consumer intention to use a technology-based service is influenced by perceived usefulness and perceived ease of use (Davis, 1989). The theory has proved useful as the two variables adopted from it were both direct predictors of consumer intention to use M-pesa. This result reinforces the TAM's predictive power.

The SCT perspective suggests that the knowledge acquisition process is directly influenced by our observation of others within social contexts (Bandura, 1994). The self-efficacy construct was adopted from this theory but its effect on intention to use M-pesa was not found to exist in this study because the hypothesis was not supported. As mentioned earlier the effects of self-efficacy on technology usage are sometimes mediated through perceived

ease of use (e.g Brown, 2002; Venkatesh, 2000). Thus, while TAM is a stronger theory than SCT in directly predicting consumer intention to use a technology-based service, SCT may be useful in accounting for variations in consumer perceptions of the technology and thus having indirect effects. This proposition is explored and is reported on in the next section.

The TRA posited by Fishbein and Ajzen (1975) offered up the subjective norm variable. This study found its influence to be significant in predicting consumer intention to use M-pesa. This finding suggests that the TRA as a social psychology theory is important in informing our knowledge of consumer intention to use technology services.

Taken together, these results suggest that consumers' motivations to comply with the norms and expectations of significant others is far more powerful to their intention to use than is their judgments of their own personal and internal capabilities necessary to perform the behaviour.

The switching costs perspective posits that there are economic and psychological costs that an individual faces in making a decision to change from one alternative product/service to another (Jones *et al.* 2002). This theory did not perform as expected because all six hypothesis informed by it were not supported.

Thus amongst the four theories, the switching cost theory produced results that are the most inconsistent with expectations. The literature suggests that perceptions of a high switching cost reduce the likelihood of a consumer's intention to switch services (Jones *et al.* 2002). The results of this study show that although the South African respondents have high perceptions of the switching costs involved in using M-pesa, they still intend to use it.

This result is interesting, and possible reasons for the differences in results are as follows:

This study adopted constructs from Jones *et al.* (2002), Burnham *et al.* (2003), and Whitten & Wakefield (2006), to inform the switching cost dimensions. The difference between the current study's focus and the above-mentioned studies is that it investigated consumer 'intention to use', while they examined repurchase intentions, intention to stay, and switching costs in outsourcing services, respectively. Studies by Jones *et al.* (2002) and Burnham *et al.* (2003) are more context specific than that of Whitten & Wakefield (2006). The Intention to use variable adopted in this study captures perceptions of why an individual would adopt the use of a service but without necessarily implying a cessation of the use of their existing

services. Thus lost performance and sunk costs may not come to influence the decision process. Moreover, other factors implying pre and post adoption costs (e.g. pre-switching search and evaluation, setup, uncertainty) may not be important since those effects are less direct than are consumers' perceptions of usefulness or ease of use.

5.5 Post-Hoc Findings

Following analysis on the hypothesized relationships in the study, the researcher deemed it necessary to further explore the possible mediated influence of the self-efficacy construct and the switching cost dimensions.

First, based on suggestions by Brown (2002) and Venkatesh (2000) on the possible mediated effect of self-efficacy on perceived ease of use, the researcher decided to test this relationship and found it to still be insignificant. This result, having been tested directly and indirectly, may suggest that an individual's self-efficacy is not particularly an important factor in predicting consumer intention to use M-pesa amongst the South African sample.

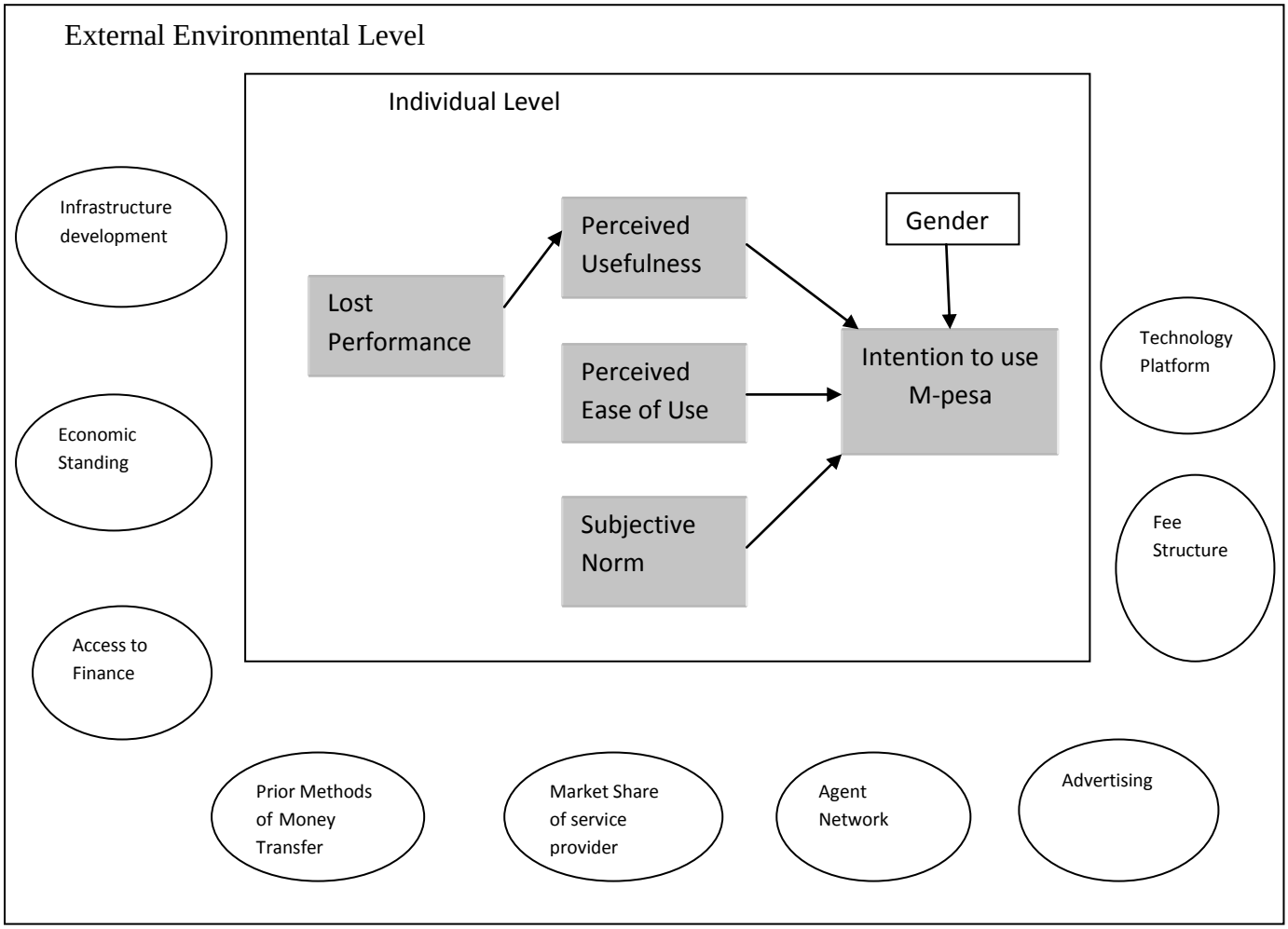
Second, the possible effects of the six switching costs dimensions were tested through the TAM variables. Only one dimension (lost performance) was mediated through perceived usefulness (See Appendix G). This finding suggests that respondents' perception of loss in using M-pesa lowers their perception of usefulness, which in turn impacts their intentions towards use of M-pesa.

5.5.1 Revised Model for intention to use M-pesa

The findings based on the South African component of the study have led to the proposal of a revised model of *intention to use M-pesa,* and is presented in figure 5.1. Perceived ease of use, perceived usefulness, and subjective norm are direct determinants of intention to use M-pesa. Pre-switching search and evaluation cost was dropped, while self-efficacy and the other switching cost dimensions (sunk cost, uncertainty cost, post-switching behavioural and cognitive cost, setup cost) did not have a direct relationship with intention to use. Lost performance has an indirect effect through perceived usefulness. Moreover, as discussed in chapter 2, user adoption occurs within a broader external environmental context. Characteristics of that context have influences on users. In particular, infrastructure development, economic standing, access to financial services, prior methods of money transfer, market share of service providers, agent network, advertising, fee structure, and

technology platform. The results of this study has aided in the discovery and proposition of a parsimonious model presented below.

Fig 5.1- *Revised model for intention to use M-pesa*



5.5.2 Application of the revised model

The model above highlights environmental factors that could possibly influence consumer intention to use a mobile technology-based service such as M-pesa. In this paper, the researcher did not empirically test the effect of these factors on intention to use M-pesa but attempted to draw links that suggest these environmental forces could impact the uptake of mobile money use in different contexts. To enhance our understanding of the impact of these factors on consumer intention to use, researchers could develop or adopt scales that measure consumers' perceptions of these factors. It should be noted that there are existing constructs in the literature that measure some of these factors. In fact, the research model in this study consisting of constructs from TAM, TRA, SCT, and switching costs theory, measure some of

these factors indirectly. For example, perceptions of 'fee structure' could to some extent be examined by adopting the setup cost construct from switching cost theory; perceptions of access to finance could somewhat be measured using the uncertainty cost construct from switching cost; perceptions of prior method of money transfer could somewhat be measured using pre-switching search and evaluation cost or sunk cost constructs from the switching cost theory; technology platform (SIM Tool-kit vs. USSD) may be measured using the PEOU construct from the TAM and its items, etc.

For the Macro-economic factors in the model; such as market share, agent network, and advertising, researchers could adopt and operationalize scales from the marketing literature that measure brand awareness and/or affiliation. Lastly, to measure the influence of infrastructure development, reference could be made to the Perceived Environmental E-readiness model (PEER). This model was posited by Molla and Licker (2005), and the model includes constructs such as 'support industries E-readiness', which assesses the availability and affordability of IT services, and the institutionalization and development of a country's financial sector. This construct could aid in assessing consumers' perceptions of this area. In essence, researchers could map the external environmental factors in the proposed model to existing constructs in the literature, and develop models to test their predictive power in influencing consumer intention to use.

5.6 Chapter Conclusion

This chapter discussed the results of the research in view of the research questions 2 and 3. Differences in results across contexts, and results of the study's proposed hypotheses were discussed. The theories used to inform the study's model were evaluated.

Explanations of the results were offered and while some of the findings concur with the literature, some new perspectives emerged. The findings were used to present an empirically informed and more parsimonious model. Finally, suggested ways on how to apply the model were discussed.

The next chapter presents a summary of the key research findings, and also reflects on the implication of the findings for research and practice. The limitations of the study will be noted, recommendations for future studies, and the conclusion of the report.

Chapter 6- Conclusion

6.1 Chapter Introduction

In the preceding chapters, a background on M-pesa was presented, literature surrounding mobile commerce, consumer behaviour, and computing behaviour were discussed, theoretical frameworks were outlined and a research model was developed, the research methodologies were discussed, the collected data was analysed, and the interpretations of the study's findings were presented.

This chapter summarizes the study. The implications of the study's findings for stakeholders are outlined. Then, the limitations of the study are noted, and areas for future research are suggested, finally the report is concluded.

6.2 Summary of the study

The estimations by the GSMA (2010) of the large number of prospective mobile money users on the continent have major implications for the African economy. Although the use of M-pesa in Africa has been a unique phenomenon, only a few studies have attempted to understand this occurrence. Prior studies on consumer use of M-pesa have addressed the issue from a single contextual and disciplinary perspective. On the other hand, this study overcame this gap by having focused on two contexts, and adopted multi-disciplinary perspectives that captured consumer and computing behaviour.

First, the study identified possible explanations of differences in the success of M-pesa launch. It did so by first exploring external environmental factors and second by considering individual level factors that may account for differences in consumer perceptions.

Next, it compared the intention to use M-pesa amongst individuals in low-income communities in two African countries. Data was collected by questionnaires, and was administered using an intercept protocol- the mall intercept method.

The data was screened, and reliability and validity tests were conducted. The study's research questions were answered using descriptive statistics, and hypotheses, which were tested with regression and PLS modelling. Factors from two of the four theories employed in this study emerged as direct influencers of consumer intention to use M-pesa. The findings re-affirm that the variables in the TAM are dominant predictors of technology use, even in an African context. Social psychology factors were also found to have direct relationships with intention

to use. Given that no prior study was found to have employed switching cost dimensions in predicting technology use, this study has created a platform on which future studies may build on.

6.3 Implications for Stakeholders

This section outlines the implications of this study's findings for practice and academia.

6.3.1 Practical Contribution

This study has identified a number of concerns that managers of mobile money services should consider when introducing the service. They should focus on the following as indicators towards understanding consumer willingness to use mobile money services.

From an external environmental perspective, managers need to understand that potential consumers may be currently serviced by other financial services, and in most cases, they are provided with incentives to remain loyal customers. Thus, when introducing a successor service, managers need to devise strategies that explicitly convey the advantages of the mobile money services over available services. For example, while there were prior financial services catering for the low-income population in South Africa, M-pesa's advantage over prior available services is that it operates on a mobile technology platform, and does not require the depositor to be physically present at an agent's outlet to make a transaction. The other services lack this advantage. Thus, M-pesa service providers need to portray this message in their advertisements to the public.

Second, from an individual perspective, awareness about the ease of use of M-pesa is very important, and it precedes the consumer's perceptions of the usefulness of the service. This means that although consumers may know about the usefulness of the service, they first need to be convinced about the relative ease of use. Given that a good number of future users of mobile money possess and use mobile phones, it is important to inform them that the procedures involved in using M-pesa do not differ much from procedures followed in sending messages.

Third, from an individual perspective, it is important to promote the M-pesa service across all consumer groups. This is because the opinions of persons who matter to future users influence their intention to use the service. Thus, while it might not be reasonable to expect

all consumers to use the service, at least they should be convinced about the value M-pesa offers. This way they can endorse its use for those who would like to use it.

6.3.2 Academic Contribution

This study has contributed by exploring M-pesa usage from two broad perspectives. First, in the literature review, a number of external environmental factors were used in an attempt to account for differences in adoption studies across Kenya and South Africa. The analysis suggested that despite the large differences at this level, even greater insights could be obtained by considering individual level factors.

In terms of examining individual level factors, this study took a multi-disciplinary approach. The multi-disciplinary approach that was employed in this study informs the various disciplines from which the theories were drawn. The theories used in this study were adopted from the field of information systems and social psychology. This study has made a specific contribution to the context of mobile money use, and has extended theory by merging factors of consumer behaviour and computing behaviour. The model developed in this study was tested and has re-affirmed the validity of the TAM, the value of social psychology factors in understanding consumer intention to use a technology-based product, and the influence of switching costs. It has extended our understanding of consumer intention to use mobile money services in Africa and has presented empirical evidence which would be useful for the various fields. Perceived ease of use emerged as the most significant predictor of intention to use M-pesa. The extent, to which the adopted theories actually predict consumer intention to use mobile money in all contexts, remains eligible for future studies.

This study has raised an interesting dimension which suggests that consumer intention to use mobile money is a combination of consumer behaviour and computing behaviour. Thus, this study provides some perspective for IS researchers on the order of influence of the TAM factors in predicting technology use amongst low-income mobile money users in Africa. For the social psychology researchers, the importance of the subjective norm factor is important in an African context in predicting intentions to use mobile money, and for the consumer behaviour researchers, switching costs in the form of lost performance is a possible influencer considered by consumers when forming opinions about the usefulness of a new technology product or service.

This study has given rise to questions about the effect path of various switching costs in using a technology-based product, and also the need to merge technology variables with social psychology variables in understanding consumer intention to use mobile technology-based products. Thus, this study has brought together factors that constitute consumer and computing behaviours.

6.3.3 Limitations of this Study

In as much as this study provides valuable insights for practice and research, it still has a few limitations.

The mall-intercept protocol adopted in this study could have excluded opinions of persons who do not visits malls, thus the findings may not be generalizable to all individuals' in the surveyed communities.

Another possible limitation of this study is that the term "intention to use" may have been misunderstood by some of the respondents. Given that a good number of the respondents in South Africa indicated high perceptions of switching costs but still indicated their intention to use the M-pesa service.

The results of this study should be interpreted with caution because the findings are based on the opinions of a relatively small number of respondents, and may not by any means be generalizable to low-income communities at large. While the results show that there is great deal of intention to use M-pesa amongst the respondents, further studies capturing a larger sample are required in order to reach a generalizable conclusion on intention to use M-pesa amongst individuals in low-income communities.

The above noted limitations could have influenced the attained results and need to be considered when assessing the contribution of this work. Consequently, the findings of this study could be considered as indicators instead of conclusions. Subsequent studies need to overcome some of the limitations of this study in order to advance our knowledge on the subject.

The next section suggests some recommendations for future research.

6.3.4 Recommendations for future research

This study has paved the way for future studies in examining other possible factors affecting consumer intention to use mobile payment services in Africa.

Some of the opportunities for further studies are outlined below:

First, given that prior studies have not tested the effect of switching cost in determining intention to use; this study could be replicated amongst a more diverse sample, as this would validate the findings and reliability of the results. Also, this study could be replicated across African countries to determine whether its results are similar or different in the various contexts.

Second, this paper explored a direct path effect model of the independent variables on the dependent variable intention to use. Future studies could explore the mediating dimensions of switching costs in predicting consumer intention to use mobile payment services. Given that most of the switching cost dimensions; sunk cost, pre-switching search and evaluation cost, post-switching behavioural and cognitive cost, setup cost, uncertainty cost, were correlated positively with intention to use, but lost performance correlated negatively with intention to use, these result give rise to questions as to whether the impact of switching cost on intention to use is a negative, positive, or relative one. It would be a worthwhile venture to investigate the possible mediating and moderating path effects of these costs.

Third, most of the respondents in South Africa indicated high perceptions of switching costs but they still indicated their positive intention to use M-pesa. This is an interesting response pattern, and thus future studies could investigate whether intention to use in Africa actually does translate to use behaviour. This investigation could reveal the extent to which intention to use camouflages actual use behaviour, and this could lead to the formation of new hypotheses and possible new research findings.

Fourth, given that the scales used in measuring intention to use were operationalized to capture an individual's self-reported probability of using the M-pesa service when next needing to transact, as well as individuals' preference for the use of M-pesa over other services/methods for transacting, future studies could further explore the construct, using the measures developed in this study. This exercise may re-validate the construct or identify other dimensions for refinement of the instrument.

Fifth, since the purpose of this study was to explore consumer intention to use a mobile payment service, future study could explore the influence of other factors on intention to use. The above noted areas for further exploration could be the basis for future studies that would extend our current knowledge on the subject.

Sixth, the majority of the respondents in Kenya and South Africa had bank accounts but the Kenyans use of M-pesa has been preferred over banking services whilst M-pesa adoption in South Africa has been slow. This may suggest that South Africans are more satisfied with their banking services than Kenyans. Although the variable of lost performance was included in this study's model, satisfaction with existing banking services was not included. Thus, future research could more explicitly incorporate this effect into explanatory models of M-pesa adoption.

Finally, although this study conceptualized the impacts of the external environmental factors, future work may wish to examine their effects empirically on decisions made at the individual user level.

6.4 Chapter Conclusion

Literature on the use of mobile based technology services in the developed world has been well established. However, little attention has been paid to its use in developing regions such as Africa. Research in this area is still in its infancy, yet the ability of mobile money service providers to attract new users, and retain current users is very important to justify their investments in developing and implementing mobile money services around the continent.

This study took a multi-disciplinary approach to explore the external environmental and individual level factors influencing intention to use a mobile based technology service in Africa. As a result of this study, we now better understand that individual usage intentions are driven by a combination of perceived ease of use, perceived usefulness, subjective norms, and lost performance. These results are valuable for the study and implementation of mobile based-technology services in developing regions.

7.0 References

Abdi, H, & Williams, L. (2010). Principal Component Analysis. Wiley Interdisciplinary Reviews: *Computational Statistics*. 2, 433-459.

Adeoti, J., & Adetola, I. (2006). Easing the Burden of Fixed Telephone lines on Small-scale Entrepreneurs in Nigeria: GSM Lines to the Rescue. *Telematics and Informatics*. 25 (1), 1-8.

Agarwal, R. & Prasad, J. (1997). The Role of Innovation Characteristics and Perceived Voluntariness in the Acceptance of Information Technologies. *Decision Sciences*. 30 (2), 361-391.

Agarwal, R., Karahanna, E. (2000). Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage. *MIS Quarterly*. 24 (4), 665-694.

Ajzen, I., & Fishbein, M. (1980). Understanding Attitudes and Predicting Social Behavior. Englewood Cliffs, NJ: Prentice-Hall.

Aker, J., & Mbiti, I. (2010). Mobile Phones and Economic Development in Africa. *Journal of Economic Perspectives*. 24 (3), 207-232.

Alan, J., Bush and Joseph, F., Hair, Jr. (1985). An Assessment of the Mall Intercept as a Data Collection Method. *Journal of Marketing Research*. 22(2), 158-167.

Aldrich, J. (1995). Correlations Genuine and Spurious in Pearson and Yule. *Statistical Science*. 10 364-376.

Avgerou, C. & Walsham, G. (Eds). (2000). Information Technology in Context: Implementing Systems in the Developing World. Aldershot, UK: Ashgate.

Bailey, K. (1982). Methods of Social Research. 2nd Edition. The Free Press, London.

Bailey, K. (1987). Methods of Social Research (3rd Edition ed.). New York: The Free Press.

Bandura, A. (1982). Self-Efficacy Mechanism in Human Agency. *American Psychologist*. 37 (2), 122-147.

Bandura, A. (1994). Self-Efficacy. In S. Ramachaudran (Ed.), *Encylopedia of human behaviour*. 4, 71-81. New York: Academic Press. (Reprinted in H. Friedman [Ed.], Encyclopedia of Mental Health. San Diego: Academic Press, 1998).

Beatty, S., Mayer, M., Coleman, J., Reynolds, K., Lee, J. (1996). Customer-Sales Associate Retail Relationship. *Journal of Retailing*. 72 (3), 223-247.

Bhatnagar, S. & Odedra, M. (1992). Social Implications of Computers in Developing Countries, New Delhi, India. Tata McGraw-Hill.

Bhattacherjee, A., & Sanford, C. (2009). The Intention-Behaviour Gap in Technology Usage: the Moderating Role of Attitude Strength. *Behaviour & Information Technology*. 28(4), 389-401.

Bold, C. (2010). In Afghanistan, Going Where No Bank Has Gone Before. Available: http://technology.cgap.org/2010/01/19/in-afghanistan-going-where-no-bank-has-gone-before/. Last accessed 5th April 2011.

Brace N., Kemp, R., & Snelgar, R. (2006). SPSS for Psychologist: A Guide to data analysis using SPSS for windows (3rd Ed). New York: Palgrave MacMillan.

Braun, J. (2007). The World Food Situation- New Driving Forces and Required Actions. Available: www.ifpri.org/sites/default/files/pubs/pubs/fpr/pr 18.pdf. Last accessed 25th Feb 2012.

Brown, I. (2002). Individual and Technology Factors Affecting Perceived Ease of Use of Web-based Learning Technologies in a Developing Country. *Electronic Journal of Information Systems in Developing Countries*. 9 (5), 1-15.

Brown, I., Cajee, Z., Davies, D., & Stroebel. S. (2003). Cell Phone Banking: Predictors of Adoption in South Africa- An Exploratory Study. *International Journal of Information Management*. 23 (5), 381-394.

Brown, S., Venkatesh, V., Kuruzovich, J., & Massey, A. (2008). Expectation Confirmation: An Examination of Three Competing Models. *Organizational Behavior and Human Decision Processes*. 105 (1), 52-66.

Burnham, T., Frels, J., & Mahajan, V. (2003). Consumer Switching Costs: A Typology, Antecedents, and Consequences. *Journal of the Academy of Marketing Science*. 31 (2), 109-126.

Butler, R. (2003). Cities and Urban Areas in South Africa with Population over 100,000. Available: www.mongobay.com/igapo/South%20Africa.htm. Last accessed 2nd Feb 2012.

Camner, G., Emil, S., & Pulver, C. (2009). What makes a Successful Mobile Money Implementation? Learning's from M-pesa in Kenya and Tanzania. Available: http://mmublog.org/wp-content/files_mf/mpesa_case_study99.pdf. Last accessed 2nd Feb 2012.

Caruana, A. (2003). Children's Perception of Their Influence over Purchases: The Role of Parental Communication Patterns. *Journal of Consumer Marketing*. 20 (1), 55-66.

Cellular Online. (2002). Statistics of Cell in South Africa. Available: http://www.cellular.co.za/stats/statistics_south_africa.htm. Last accessed 25th Oct 2011.

Cellular news. (2010). Vodacom South Africa to Offer Mobile Money Transfer. Available: http://www.cellular-news.com/story/41980.php. Last accessed 25th May 2010.

Central Intelligence Agency. (2011). The World FACTBOOK/KENYA. Available: www.cia.gov/library/publications/the-world-factbook/geos/ke.html. Last accessed 25th Feb 2012.

Central Intelligence Agency. (2011). The World FACTBOOK/SOUTH AFRICA. Available: www.cia.gov/library/publications/the-world-factbook/geos/sf.html. Last accessed 25th Feb 2012.

Chatterjee, D., Grewal, R., & Sambamurthy, V. (2002). Shaping up for E-commerce: Institutional Enablers of the Organizational Assimilation of Web Technologies. *MIS Quarterly*. 26 (2), 65-89.

Chen, P., & Hitt, L. (2002). Measuring Switching Costs and the Determinants of Customer Retention in the Internet-Enabled Businesses: A Study of the Online Brokerage Industry. *Information Systems Research*. 13 (3), 255-274.

Cheung, C., Lee, M., & Chen, Z. (2002). Using the Internet as a Learning Medium: An Exploration of Gender Difference in the Adoption of FaBWeb. Proceedings of the 35th Hawaii International Conference on Systems Sciences, USA.

Chigona, W., Beukes, D., Vally, J., & Tanner, M. (2009). Can Mobile Internet Help Alleviate Social Exclusion in Developing Countries? *The Electronic Journal of Information Systems in Developing Countries*. 36 (7), 1-16.

Child, D. (1990). The Essentials of Factor Analysis, Second Edition. London: Cassel Educational Limited.

Chin, W. (1998). The Partial Least Squares Approach for Structural Equation Modeling in Modern Methods for Business Research. New Jersey: Marcoulides.

Cohen, J. (1988). Statistical Power Analysis for the Behavioral sciences. New Jersey: Hillsdale.

Compeau, D., & Higgins, C. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*. 19 (2), 189-211.

Communications Commission of Kenya (CCK). 2009. Sector Statistics Report April-June 2008/09. Nairobi, Kenya.

Creswell, J. (2003). Research design: Qualitative, Quantitative, and Mixed Methods Approaches. 2nd edition. Sage Publications. California, USA.

Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. *MIS Quarterly* 13 (3), 319-339.

Davis, F., Bagozzi, R. & Warshaw, P. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*. 35 (8), 982-1003.

Dekimpe, M., Parker, P., & Sarvary, M. (2000). Global Diffusion of Technological Innovations: A Coupled-Hazard Approach. *Journal of Marketing Research*. 37 (1), 47-59.

Deloitte. (2010). Banking the Bottom of the Pyramid. Available: http://www.deloitte.com/assets/Dcom-SouthAfrica/Local%20Assets/Documents/Banking%20the%20Bottom%20of%20the%20Pyramid_16112010.pdf.

Demombynes, G., & Thegeya, A. (2012). "Kenya's Mobile Revolution and the Promise of Mobile Savings." *World Bank Policy Research Working Paper*, No. 5988.

De Ruyter, K., Wetzels, M., & Bloemer, J. (1998). On the Relationship between Perceived Service Quality, Service Loyalty and Switching Costs. *International Journal of service industry management*. 9(5), 436-453.

Dick, A., & Lord, K. (1998). The Impact of Membership Fees on Consumer Attitude and Choice. *Psychology & Marketing*. 15 (1), 41-58.

Djiofack-Zebaze, C., & Keck, A. (2009). Telecommunications Services in Africa: The Impact of WTO Commitments and Unilateral Reform on Sector Performance and Economic Growth. *World Development*. 37 (5), 919-940.

Donner, J. (2006). The Use of Mobile Phones by Micro-entrepreneurs in Kigali, Rwanda: Changes to Social and Business Networks. *Information Technologies and International Development*. 3 (2), 2006.

Donner, J. (2007). The Rules of Beeping: Exchanging Messages via Intentional "Missed Calls" on Mobile Phones. *Journal of Computer-Mediated Communication*. 13 (1), 1-22.

Donner, J. (2008). Research Approaches to Mobile Use in the Developing World: A Review of the Literature. *The Information Society: An International Journal*. 24 (3), 140-159.

Eachus, P. (1999). Research Methods for Health Sciences. [Online] Available:

http://www.chssc.salford.ac.uk/healthSci/resmeth2000/resmeth/ch2meas.htm [14 July 2011].

Economist. (2009). The Power of Mobile Money, *the Economist*, September, 26th.

Esselaar, S., & Stork, C. (2005). Mobile Cellular Telephone: Fixed-line Substitution in Sub-Saharan Africa. *South African Journal of Information and Communication*. 6 (0), 64-73.

Fenech, T. (1998). "Using Perceived Ease of Use and Perceived Usefulness to Predict Acceptance of the World Wide Web." *Computer Networks & ISDN Systems*, 30(1-7): 629-

630.

Finaccess. (2007). Financial Access in Kenya: Results of a 2006 National Survey. Nairobi.

Finscope. (2011). Financial Scope on Kenya. Available: http://www.finscope.co.za/new/pages/Initiatives/Countries/Kenya.aspx?randomID=081c517e-ecd1-45ab-b1ff-4ef884329092&linkPath=3_1&lID=3_1_3. Last accessed 22nd Dec 2011.

Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. MA: Addison- Wesley, Reading.

Fornell, C., & Larcker, D. (1981). Evaluating Structural Equations with Unobservable Variables and Measurement Error. *Journal of Marketing Research*. 18 (1), 39-50.

Gallivan, M., (2001). Organizational Adoption and Assimilation of Complex Technological Innovations: Development and Application of a New Framework. *ACM SIGMIS*. 32 (3), 51-85.

Garbacz, C., & Thompson, H. (2007). Demand for Telecommunication Services in Developing Countries. *Telecommunications Policy*. 31 (5), 276-289.

Gefen, D., & Straub, D. (1997). Gender Differences in the Perception and Use of E-Mail: An Extension to the Technology Acceptance Model. *MIS Quarterly*. 21 (4), 389-400.

Gettleman, J. (2006). Chased by Gang Violence, Residents Flee Kenya Slum. *The New York Times.*

Ghauri, P., & Gronhaug, K. (2005). Research Methods in Business Studies, 3rd Edition. Pearson Education Limited.

Girard, C. (1993). Age, Gender, and Suicide: A Cross-National Analysis. *American Sociological Review*. 58(4), 553-574.

Gliem, J., & Gliem, R. (2003). Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. *Midwest Research to Practice Conference in Adult, Continuing, and Community Education*, 82-88. Columbus.

Goetz, M. (2009). Mobile Business Models in African Rural Communities. Available: www.connecting-africa.net/quesry_2.php?ire=IR0000052&rid+B00011163. Last accessed 26th Dec 2011.

Goodman, J. (2007). Linking Mobile Phone Ownership and Use to Social Capital in Rural South Africa and Tanzania. Moving the Debate Forward: The Vodafone Policy Paper Series #2
3005.Http://www.vodafone.com/etc/medialib/attachments/cr_downloads.Par.78351.File.tmp/GPP_SIM_paper_3.pdf. Last accessed Dec 21, 2011.

Gotz, G. (2004). The Role of Local Government towards Forced Migrants. In: Landay, L. (ed.) Forced Migrants in the New Johannesburg: Towards a Local Government Response. Johannesburg, South Africa, University of the Witwatersrand, Forced Migration Studies Programme.

Greengard, S. (2008). Upwardly Mobile. *Communications of the ACM*. 51 (12), 17-19.

Gruber, H., & Koutroumpis, P. (2011). Mobile Telecommunications and the Impact on Economic Development. *Economic Policy*. 67 (0), 1-41.

GSMA. (2009). Mobile World Celebrates Four Billion Connections~ GSM World.[Online] Available at: http://www.gsmworld.com/newsroom/press-releases/2009/2521.html. Last accessed 12 Dec 2011.

GSMA. (2010). Mobile Money for the Unbanked: Annual Report 2009: http://www.gsmworld.com/documents/mmu_2009_annual_report.pdf/2011/03/05/mobile-money-for-the-unbanked/. Last accessed 5th March 2011.

Guiltinan, J. (1989). A Classification of Switching Costs with Implications for Relationship Marketing. In: Childers TL, Bagozzi RP, Peter JP, editors. AMA Winter Educators' Conference: Marketing Theory and Practice. Chicago, IL: *American Marketing Association*. 216-220.

Guriting, P., & Ndubisi, A. (2006). Borneo Online Banking: Evaluating Customer Perceptions and Behavioural Intention. *Management Research*. 29 (1), 6-15.

Gwinner, K., Gremler, D., Bitner, M. (1998). Relational Benefits in Service Industries: The Customer's Perspective. *Journal of the Academy of Marketing Science*. 26 (2), 101-114.

Hair, F., Anderson, E., Tatham, L. & Black, C. (1998), Multivariate Data Analysis, 5th Edition. Englewood Cliffs, NJ: Prentice-Hall.

Hair, F., Black, C., Babin, B., Anderson, E. & Tatham, L. (2006). 6th edition. Multivariate Data Analysis. New Jersey, U.S.: Pearson Education.

Hamilton, J. (2003). Are Main Lines and Mobile Phones Substitutes or Complements? Evidence from Africa. *Telecommunications Policy*. 27 (0), 109-133.

Henderson, R., & Divett, M. (2003). Perceived Usefulness, Ease of Use and Electronic Supermarket Use. *International Journal of Human-Computer Studies*. 59 (3), 383-395.

Hernandez, B., Jimenez, J., & Martin, M. (2008). Extending the Technology Acceptance Model to Include the IT Decision-maker: A Study of Business Management Software. *Technovation*. 28(3), 112-121.

Hodge, J. (2005). Tariff Structures and Access Substitution of Mobile Cellular for Fixed Line in South Africa. *Telecommunications Policy*. 29 (7), 493-505.

Hong, S., & Tam, K. (2006). Understanding the Adoption of Multipurpose Information Appliances: The Case of Mobile Data Services. *Information Systems Research*. 17 (2), 162-179.

Hsu, C., Lu, H., & Hsu, H. (2007). Adoption of the Mobile Internet: An Empirical Study of Multimedia Message Service (MMS). *Omega.* 35(6), 715-726.

Hughes, N., & Lonie, S. (2007). M-PESA: Mobile Money for the 'Unbanked.' Turning Cell Phones into 24-Hour Tellers in Kenya'. *Innovations: Technology, Governance, Globalization*. 2 (2), 63–81.

Hung, S., Ku, C., & Chang, C. (2003). Critical Factors of WAP Services Adoption: An Empirical Study. *Electronic Commerce Research and Applications*. 2(1), 42-60.

Idowu, B., Ogunbodede, E., & Idowu, B. (2003). Information and Communication Technology in Nigeria: The Health Sector Experience. *Journal of Information Technology Impact*. 3 (2), 69-76.

Igbaria, M., Zinatelli, N., Cragg, P., & Cavaye, A. (1997). Personal Computing Acceptance Factors in Small Firms: A Structural Equation Modeling. *MIS Quarterly*. 21 (3), 279-305.

ITNewsAfrica. (2010). Vodacom and Nedbank to launch M-PESA in South Africa. Available: http://www.itnewsafrica.com/?p=6595. Last accessed 21 April 2010.

International Telecommunication Union. (2009). Information Society Statistical Profiles

2009-Africa. http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-RPM.AF-2009-PDF-E.

Pdf.

Ivatury, G., & Mas, I. (2008). The Early Experience with Branchless Banking. Available: www.cgap.org/gm/document-1.9.2640/FN46.pdf. [Accessed 2nd Feb 2012].

Jack, W., & Suri. T. (2011). Mobile Money: The Economics of M-PESA. Working Paper.

Jackson, C., Chow, S., & Leitch, R. (1997). Towards an Understanding of the Behavioral Intention to Use an Information System. *Decision Sciences*. 28 (2), 357-389.

Jensen, M. (2001). The African Internet. A status report. Available: www.3.wn.apc.org/africa/afstat.htm. Last accessed: 7th May 2011.

John, O., & Benet-Martinez, V. (2000). Measurement: Reliability, Construct Validation, and Scale Construction. In H. Reis & Judd, C. (Eds.), Handbook of Research Methods in Social Psychology, 339-369. New York: Cambridge University Press.

Jones, M., Mothersbaugh, D., & Beatty, S. (2000). Switching Barriers and Repurchase Intentions in Services. *Journal of Retailing*. 76 (2), 259-274.

Jones, M., Mothersbaugh, D., Beatty, S. (2002). Why Customers Stay: Measuring the Underlying Dimensions of Services Switching Costs and Managing their Differential Strategic Outcomes. *Journal of Business Research*. 55(6), 441-450.

Kaba, B., Diallo, A., Plaisent, M., Bernard, P., & N'Da, K. (2006). Explaining the Factors Influencing Cellular Phone Use in Guinea. *Electronic Journal of Information Systems in Developing Countries*. 28 (3), 1-7.

Kamga, O. (2006). Mobile Phone in Cote d; Ivoire: Uses and Self-fulfilment. Paper presented at International Conference on Information and Communication Technologies and Development, May 25-26, Berkeley, CA.

Karahanna, E., Agarwal, R., & Angst, C. (2006). Reconceptualizing Compatibility Beliefs in Technology Acceptance. *MIS Quarterly*. 30 (4), 781-804.

Karahanna, E., Straub, D., & Chervany, N. (1999). Information Technology Adoption across Time: A Cross-sectional Comparison of Pre-adoption and Post-adoption Beliefs. *MIS Quarterly*. 23(2), 183-213.

Kenya National Bureau of Statistics. (2009). Population & Housing Census Results. Available: www.knbs.or.ke/docs/presentationbyministerforplanningrevised.pdf. Last accessed 25th Oct 2011.

Kenyatta University. (2011). Githurai Community. Available: http://www.ku.ac.ke/Githurai/index.html. Last accessed 25th Feb 2012.

Kim, H., Chan, C. & Gupta, S. (2007). Value-based Adoption of Mobile Internet: An Empirical Investigation. *Decision Support Systems*. 43 (1), 111–126.

Kini, R., & Thanarithporn, S. (2004). Mobile Commerce and Electronic Commerce in Thailand: A Value Space Analysis. *International Journal of Mobile Communication*. 1 (2), 22-37.

Kleijnen, M., Ruyter, K., & Andreassen, T. (2005). Image Congruence and the Adoption of Service Innovations. *Journal of Service Research*. 7 (4), 343-359.

Krishna, S., & Madon, S. (2003). The Digital Challenge: Information Technology in the Development Context. Aldershot, UK: Ashgate.

Kurnia, S., Smith, S., & Lee, H. (2006). Consumers' Perception of Mobile Internet in Australia. *E-Business Review*. 5 (1), 19-32.

Lacity, M., & Willcocks, L. (2000). Relationships in IT outsourcing: A Stakeholder Perspective. In R. Zmud (Ed.), Framing the Domains of IT Management: Projecting the Future through the Past. Cincinnati, OH: Pinnaflex, 355–384.

Lau, A., Yen, J., & Chau, P. (2001). Adoption of On-line Trading in Hong Long Financial Market. *Journal of Electronic Commerce Research*. 2 (2), 58-65.

Lee, A. (1999). Rigor and Relevance in MIS Research: Beyond the Approach of Positivism Alone. *MIS Quarterly*, 23 (1), 25-28.

Lee, E., Lee, J., & Eastwood, D. (2003). A Two-Step Estimation of Consumer Adoption of Technology Based Service Innovations. *The Journal of Consumer Affairs*. 37 (2), 256-282.

Leedy, P., & Ormrod, E. (2005). Practical Research: Planning and Design. 8th edition. New Jersey, U.S.A: Pearson Prentice-Hall.

Legris, P., Ingham, J., & Collerette, P. (2003). "Why Do People Use Information Technology? A Critical Review of the Technology Acceptance Model". *Information & Management*. 40 (3), 191-204.

Liao, C., Tsou, C., & Huang, M. (2007). Factors Influencing the Usage of 3G Mobile Services in Taiwan. *Online Information Review*. 31 (6), 759-774.

Lowry, G. (2002). Modelling User Acceptance of Building Management Systems. *Automation in Construction*. 11 (6), 695-705.

Luarn, P., & Lin, H. (2005). Toward an Understanding of the Behavioral Intention to Use Cell phone Banking. *Computers in Human Behaviour*. 21 (6), 873-891.

Lu, J., Yu, C., Liu, C., & Yao, J. (2003). Technology Acceptance Model for Wireless Internet. *Internet Research*. 13 (3), 206-222.

Lucas, H., & Spitler, V. (1999). Technology Use and Performance: A Field Study of Broker Workstations. *Decision Sciences*. 30 (2), 291-311.

Luo, X., Li, H., & 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(2), 222-234.

Maharaj, Y. (2010). South Africa Telecommunication Market. Available: www.analytixbi.com/pdf/SACR-TelecommsMarket.pdf. Last accessed 12th Jan 2012.

Malhotra, Y., & Galletta, F. (1999). Extending the Technology Acceptance Model to Account for Social Influence: Theoretical Bases and Empirical Validation. Proceedings of the 32nd Hawaii International Conference on Systems Science. 1-14. 1EEE.

Mallat, N. (2007). Exploring Consumer Adoption of Mobile Payments – A Qualitative Study. *Strategic Information Systems*. 16 (1), 413-432.

Mallat, N., Rossi, M., Tuunainen, V., & Oorni, A. (2006). The Impact of Use Situation and Mobility on the Acceptance of Mobile Ticketing Services. Proceedings of the 39th Hawaii International Conference on System Science, USA.

Marakas, G., Johnson, R., & Clay, F. (2007). The Evolving Nature of the Computer Self-Efficacy Construct: An Empirical Investigation of Measurement Construction, Validity, Reliability and Stability over Time. *Journal of Association of Information Systems*. 8 (1), 16-46.

Mas, I., & Morawczynski, O. (2009). Designing Mobile Money Services: Lessons from M-pesa. *Innovations; Technology, Governance, Globalization*. 4 (2), 77-91.

Mathieson, K. (1991). Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behaviour. *Information Systems Research.* 2 (3), 173-191.

Mathieson, K., Peacock, E. & Chin, W. (2001). Extending the Technology Acceptance Model: The Influence of Perceived User Resources. *The Data Base for Advances in Information Systems*. 32 (3), 86-112.

Mbarika, V., Musa, P., Byrd, T., & McMullen, P. (2002). Teledensity Growth Constraints and Strategies for Africa's LDC's: Viagra Prescriptions or Sustainable Development Strategies? *Journal of Global Information Technology Management*. 5 (1), 25-42.

Mbiti, I., & Weil, D. (2011). Mobile Banking: The Impact of M-pesa in Kenya. NBER Working Paper Series. Vol. w17129. Available at SSRN: http://ssrn.com/abstract=1866089.

Mbogo, M. (2010). The Impact of Mobile Payments on the Success and Growth of Micro-Business: The Case of M-pesa in Kenya. *The Journal of Language, Technology & Entrepreneurship in Africa*. 2 (1), 182-203.

McCarty, J., & Shrum, L. (1993). The Role of Personal Values and Demographics in Predicting Television Viewing Behaviour: Implications for Theory and Application. *Journal of Advertising*. 22 (4), 77-101.

McKee, D., Simmers, C., & Licata, J. (2006). Customers Self-Efficacy and Response to Service. *Journal of Service Research*. 8 (3), 207-220.

McLeod, D. (2011). Vodacom aims for 10m M-pesa Users. Available: http://www.techcentral.co.za/vodacom-aims-for-10m-m-pesa-users/16604/. Last accessed 5th April 2011.

Meso, P., Musa, P., & Mbarika, V. (2005). Towards a Model of Consumer Use of Mobile Information and Communication Technology in LDCs: The Case of Sub-Saharan Africa. *Information Systems Journal*. 15 (2), 119-146.

Miller, K. (2005). Communications Theories: Perspectives, Processes, and Contexts. New York, U.S.: McGraw-Hill.

Molla, A., & Licker, P. (2005). Perceived E-Readiness Factors in E-commerce Adoption: An Empirical Investigation in a Developing Country. *International Journal of Electronic Commerce*. 10(1), 83-110.

Molony, T. (2006). "I Don't Trust the Phone; It Always Lies": Trust and Information and Communication Technologies in Tanzanian Micro and Small Enterprises. *Information Technologies and International Development*. 3 (4), 67-83.

Morales-Gomez, D., & Melesse, M. (1998). Utilising Information and Communication Technologies for Development: The Social Dimensions. *Information Technology for Development*. 8 (1), 3-13.

Morawczynski, O., & Miscione, G. (2008). Examining Trust in Mobile Banking Transactions: The Case of M-PESA in Kenya. Social Dimensions for Information and Communications Technology. In Avgerou, C., Smith, M., & Van der Besselaar (Eds), 282, 287-298. Boston: Springer.

Morawczynski, O. (2008). Surviving in the 'Dual System': How M-PESA is Fostering Urban-to-Peri-Urban Remittances in a Kenyan Slum. Paper presented at the IFIP WG 9.4-University of Pretoria Joint Workshop, Pretoria, South Africa. <http://www.nextbillion.net/multimedia/2008/05/29/surviving-in-the-dualsystem-how-m-pesa-is-fostering-urban-to-peri-urban-remittances-in-a-kenyan-slum>. Last accessed 21st April 2011.

Morawczynski, O. (2009). Exploring the Usage and Impact of "Transformational" Mobile Financial Services: The Case of M-pesa in Kenya. *Journal of Eastern African Studies*. 3(3), 509-525.

Morgan, R., & Hunt, S. (1994). The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*. 58, 20-38.

Musa, P. (2006). Making a Case for Modifying the Technology Acceptance Model to Account for Limited Accessibility in Developing Countries. *Information Technology for Development*. 12 (3), 213-224.

Muwanguzi, S., & Musambira, G. (2009). The Transformation of East Africa's Economy Using Mobile Phone Money Transfer Services: A Comparative Analysis of Kenya and Uganda's Experiences. *Journal of Creative Communications*. 4 (2), 131-146.

Nair, A., & Kloeppinger-Todd, R. (2007). Reaching Rural Areas with Financial Services: Lessons from Financial Cooperatives in Brazil, Burkina Faso, Kenya, and Sri Lanka. World Bank, Working Paper #39357.

Neuman, W. (1994). Social Research Methods: Qualitative and Quantitative Approaches. 2nd edition. Massachusetts: Allyn and Bacon.

Neuman, W. (2006). Social Research Methods: Qualitative and Quantitative Approaches. 6th edition. Pearson International Edition. Boston.

Ngugi, B., Pelowski, M., & Ogembo, J. (2010). M-pesa: A Case Study of the Critical Early Adopters' Role in the Rapid Adoption of Mobile Money Banking in Kenya. *The Electronic Journal of Information Systems in Developing Countries*. 43 (3), 1-16.

Nielson, C. (1996). An Empirical Examination of Switching Costs Investments in Business-to-Business Marketing Relationships. *The Journal of Business and Industrial Marketing*. 11, 38-60.

Norton, S. (1992). Transaction costs, Telecommunications, and the Microeconomics of Macroeconomic Growth. *Economic Development and Cultural Change*. 41 (1), 175-196.

Nunnally, J. (1978). Psychometric Theory. 2nd edition. U.S.A. McGraw-Hill, Inc.

Nyabiage, J. (2011). Kenya: Safaricom's Market Share Takes a Hit in Mobile Price Wars. Available: http://allafrica.com/stories/201101160004.html. Last accessed 20th Dec 2011.

Ochieng, E., & Ochola, A. (2011). Local Champions: Towards Transparent Accountable Governance in Embakassi, Kenya . Available: pubs.iied.org/pdf/G03203.pdf. Last accessed 11th Jan 2012.

Odedra-Straub, M. (1996). Global Information Technology and Socio-Economic Development. Nashua, NH: Ivy League.

Orlikowski, W., & Iacono, C. (2001). Research Commentary: Desperately Seeking "IT" in IT Research- A call to the Theorizing the IT Artifact. *Information Systems Research*. 12 (2), 121-134.

Oucho, J. (1996). Urban Migrants and Rural Development in Kenya, Nairobi: Nairobi University Press.

Owuor, S. (2004).Urban Households Ruralising Their Livelihoods: The Changing Nature of Urban-Rural Linkages in an East African Town. *African Studies Centre Seminar Series*. Leiden.

Pallant, J. (2007). SPSS Survival Manual. New York, U.S: McGraw-Hill.

Payne, T. (2011). SA Struggles to Meet Banking Targets. Available: mg.co.za/article/2011-12-09-sa-struggles-to-meet-banking-targets/. Last accessed: 22nd Jan 2012.

Perry, A., & Wadhams, N. (2011) "Kenya's Banking Revolution." *Time Magazine*. 31 Jan: 41-44.

Ping, R. (1993). The Effects of Satisfaction and Structural Constraints on Retailer Exiting, Voice, Loyalty, Opportunism and Neglect. *Journal of Retailing*. 69, 320-352.

Pinsonneault, A. & Kraemer, L. (1993). Survey Research Methodology in Management Information Systems: An Assessment. *Journal of Management Information Systems*. 10 (2), 75-105.

Plouffe, R., Vandenbosch, M., & Hulland, J. (2001). Intermediating Technologies Multi-Group Adoption: A Comparison of Consumer and Merchant Adoption Intentions towards a New Electronic Payment System. *Journal of Product Innovation Management*. 18(2), 65–81.

Plyer, M., Haas, S., & Nagarajan, G. (2010). Community-Level Economic Effects of M-pesa in Kenya: Initial Findings. *Financial Services Assessment*. 1-46.

Podsakoff, P., MacKenzie, S., Lee, J., & Podsakoff, N. (2003). Common Method Bias in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*. 88, 879-903.

Podsakoff, P., & Organ, D. (1986). Self-reports in Organizational Research: Problems and Prospects. *Journal of Management*. 12(2), 531-544.

Polatoglu, V., & Ekin, N. (2001). An Empirical Investigation of the Turkish Consumers' Acceptance of Internet Banking Services. *International Journal of Bank Marketing*. 19 (4), 156-165.

Posel, D., & Casale, D. (2003). What has been happening to Internal Labour Migration in South Africa, 1993-1999? *South African Journal of Economics*. 71 (3), 455-479.

Posel, D., & Casale, D. (2006). Internal Migration and Household Poverty in Post-Apartheid South Africa. In Poverty and Policy in Post-Apartheid South Africa, ed. Ravi Kanbur and Haroon Bhorat, 351-65. Pretoria: Human Sciences Research Council Press.

Richardson, B. (2007). WIZZIT. Available: http://cab.org.in/Lists/Knowledge%20Bank/Attachments/77/WIZZIT%20E-Mail%20presentation%20April-%20Banking%20at%20the%20Bottom%20of%20the%20Pyramid.pdf. Last accessed 11th Oct 2011.

Riemenschneider, C., Harrison, D., & Mykytn, P. (2003). Understanding IT Adoption Decision in Small Business: Integrating Current Theories. *Information & Management*. 40 (4), 269-285.

Roberts, P., & Henderson, R. (2000). Information Technology Acceptance in a Sample of Government Employees: A Test of the Technology Acceptance Model. *Interacting with Computers*. 12 (5), 427-443.

Robertson, I. (1989). Society: A Brief Introduction. New York, U.S.: Worth Publishing Co.

Rogers, E. (1995). Diffusion of Innovations, 4th ed. New York, U.S.: Free Press.

Rogers, E. (2003). Diffusion of Innovations, 5th ed. New York, U.S.: Free Press.

Safaricom. M-pesa Services. Available: http://www.safaricom.co.ke/index.php?id=257. Last accessed: 15th Sep 2011.

Safaricom. (2009). MPESA Key Performance Statistics. http://www.safaricom.co.ke/

fileadmin/template/main/images/MiscUploads/M-PESA%20Statistics.pdf. Last accessed: 2nd Feb 2011.

Sahay, S., & Avgerou, C. (2002). Introducing the Special Issue on Information and Communication Technologies in Developing Countries. The Information Society: *An International Journal*. 18 (2), 73-76.

Sander, C., & Maimbo, S. (2005). Migrant Remittances in Africa: A Regional Perspective. In Maimbo, S.M. & Ratha, D. (eds), Remittances: Development Impact and Future Prospects (53-71). Washington, D.C. World Bank.

Saunders, R., Warford, J., & Wellenieus, B. (1994). Telecommunications and Economic Development (2nd ed.). Baltimore, MD: Johns Hopkins University Press.

Schepers, J., & Wetzels, M. (2007). A Meta-Analysis of the Technology Acceptance Model: Investigating Subjective Norm and Moderation Effects. *Information & Management*. 44 (0), 90-93.

Scott, N., McKemyey, K., & Batchelor, S. (2004). The Use of Telephones amongst the Poor in Africa: Some Gender Implications. *Gender Technology and Development*. 8 (2), 185-207.

Shackleton, S. (2007). *Women's net Rapid Assessment of Cell Phones for Development*, Commissioned by UNICEF, Johannesburg: Newton.

Sharma, N., & Patterson, P. (2000). Switching Costs, Alternative Attractiveness and Experience as Moderators of Relational Commitment in Professional, Consumer Services. *International Journal of Service Industry Management.*11 (5), 470-482.

Shen, K., & Khalifa, M. (2008). Exploring Multidimensional Conceptualization of Social Presence in the Context of Online Communities. *International Journal of Human-Computer Interaction.* 24 (7), 722-748.

South Africa. Info. (2003). South Africa Infrastructure. Available: http://qqq.southafrica.info/doing_business/economy/infrastructure/telecoms. Last accessed 21st Jan 2012.

Speckman, A. (2011). Vodacom Rings Changes with its M-pesa Service .Available: http://bankmonitorsa.blogspot.com/2011/06/vodacom-rings-changes-with-its-m-pesa.html. Last accessed 12th July 2011.

Sridhar, K., & Sridhar, V. (2006). Telecommunications and Growth: Causal Model, Quantitative and Qualitative Evidence. *Economic and Political Weekly*. 2611-2619.

Stake, R. (1995). The Art of Case Study Research. London: SAGE Publications.

Subramanian, G. (1994). A Replication of Perceived Usefulness and Perceived Ease of Use Measurement. *Decision Sciences*. 25 (5-6), 863-874.

Suoranta, M., & Mattila, M. (2004). Mobile Banking and Consumer Behaviour: New Insights into the Diffusion Pattern. *Journal of Financial Services Marketing*. 8(4), 354-366.

Szajna, B. (1996). Empirical Evaluation of the Revised Technology Acceptance Model. *Management Science*. 42 (1), 85-92.

Tall, S. (2004). Review of African Economy. Senegalese émigrés. *New Information & Communication Technologies*. 31 (99), 31-48.

Techmtaa. (2011). Safaricom's M-PESA Service Now Enters into a Global Alliance with Western Union. Available: http://www.techmtaa.com/2011/04/01/safaricoms-m-pesa-service-now-enters-into-a-global-alliance-with-western-union/. Last accessed 1st April 2011.

Terre Blanche, M., Durrheim, K., & Painter, D. (2008). Research in Practice: Applied Methods for Social Sciences. Cape Town: Juta Press.

Thieme, T. (2010). British Institute of East Africa Seminar in Nairobi: Youth, Work and Waste in Mathare: Whose Business and Whose Politics?

Tobbin, P., & Kuwornu, J. (2011). Adoption of Mobile Money Transfer Technology: Structural Equation Modeling Approach. *European Journal of Business and Management*. 3(7), 59-77.

Turnbull, P., & Wilson, D. (1989). Developing and Protecting Profitable Customer Relationships. *Industrial Marketing Management*. 18 (3), 233-238.

Van Biljon, J., & Kotze, P. (2007). Modeling the Factors that Influence Mobile Phone Adoption. In Proceedings of the 2007 Annual Research Conference of the South African Institute of Computer Scientists and Information Technologists on IT Research in Developing Countries, Port Elizabeth, South Africa, 152-161. New York: ACM Press.

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research*. 11(4) 342–365.

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*. 39 (2), 273-315.

Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*. 46 (2), 186-204.

Venkatesh, V., Davis, F., & Morris, M. (2007). Dead or Alive? The Development, Trajectory and Future of Technology Adoption Research. *Journal of the Association of Information Systems*. 8 (4), 267-286.

Venkatesh, V., Morris, G., Davis, F., & Davis, G. (2003). User Acceptance of Information Technology: Towards a Unified View. *MIS Quarterly*. 27 (3), 425-478.

Venkatesh, V., & Morris, M. (2000). Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence, and their Role in Technology Acceptance and Usage Behaviour. *MIS Quarterly*. 24 (1), 115-139.

Venkatesh, V., & C. Speier. (2000) "Creating an Effective Training Environment for Enhancing Telework". *International Journal of Human Computer Systems*. 52 (6), 991-1005.

Walsham, G. (2002). Cross-Cultural Software Production and Use: A Structurational Analysis. *MIS Quarterly*. 26 (4), 359-380.

Walsham, G., Robey, D., & Sahay, S. (2007). Foreword: Special Issue on Information Systems in Developing Countries. *MIS Quarterly*. 31(2), 317-326.

Wang, S., & Barnes, S. (2007). Exploring the Acceptance of Mobile Auctions in China. Proceedings of the Sixth International Conference on the Management of Mobile Business, Toronto, Canada.

Wang, S., & Lin, Y. (2005). NCTUns Network Simulation and Emulation for Wireless Resource Management. *Wireless Communication and Mobile Computing*. 5, 899-916.

Wang, Y., Lin, H., & Luarn, P. (2006). Predicting Consumer Intention to Use Mobile Service. *Information Systems Journal*. 16(2), 157-179.

Wang, S., Wang, M., Lin, H. & Tang, T. (2003). Determinants of User Acceptance of Internet Banking: An Empirical Study. *International Journal of Service Industry Management*. 14 (5), 501-519.

Warren, M. (2002). Adoption of ICT in Agricultural Management in the United Kingdom: The Intra-Rural Digital Divide. *Agric. Econ*. 48 (1), 1-8.

Weiss, A., & Anderson, E. (1992). Converting From Independent Employee Salesforces: The Role of Perceived Switching Costs. *Journal of Marketing Research*. 29 (1), 101-115.

Whitten, D., & Wakefield, R. (2006). Measuring Switching Costs in IT Outsourcing Services. *The Journal of Strategic Information Systems*. 15 (3), 219-248.

World Bank. (2009). World Development Indicators. Washington, DC: World Bank. http://publications.worldbank.org/WDI/.

Wu, J., & Wang, S. (2005). What Drives Mobile Commerce? An Empirical Evaluation of the Revised Technology Acceptance Model. *Information & Management*. 42, 719-729.

Yang, K. (2005). Exploring Factors Affecting the Adoption of Mobile Commerce in Singapore. *Telematics and Informatics*. 22 (3), 257-277.

Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to Explain Mobile Banking User Adoption. *Computers in Human Behaviour*. 26 (4), 760-767.

8.0 Appendices

Appendix A- Survey Instrument administered in Kenya

Participant Information Sheet

Introduction

Good day,

My name is Olam Osah and I am currently enrolled as a student at the University of the Witwatersrand, Johannesburg, in pursuit of a Master's degree in Information Systems. I am inviting you to participate in a survey which aims to collect data on understanding consumers' adoption intentions towards a mobile payment service (M-pesa).

This survey should take approximately 20-25 minutes to complete.

Should you be willing to participate in this survey, your responses will be used solely for research purposes. The questionnaire is completely anonymous and will not contain any information that could personally identify you. Should you consider participating in this survey, you will not be exposed to any harm or damage and your response will be confidential. This survey is voluntary and you may choose to opt out at any time without any loss of any benefits due to you.

This survey has been approved unconditionally by the University of the Witwatersrand, Johannesburg, Human Ethics Committee (Non-Medical), and the protocol number is: **H110704.**

Thank you for considering participating in this survey. Should you have any questions or should you wish to obtain a copy of the results, please contact me on: 078 774 3717 or email osah07@gmail.com

Olam Osah.

Division of Information Systems

School of Economic & Business Sciences

University of the Witwatersrand, Johannesburg.

Please indicate, by marking with an (x), the extent to which you agree with each of the following statements.

For each statement, please select <u>one</u> response that best matches your level of agreement.	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1. I believe that M-pesa will be useful for me.							
2. I believe that M-pesa will allow me to send or receive money from wherever I am.							
3. I believe that using M-pesa will reduce the time it takes me to send or receive money.							
4. I believe that using M-pesa will make it easier for me to send or receive money.							
5. I think M-pesa is very easy to understand.							
6. Overall, I think using M-pesa will be less expensive for me to send and receive money.							
7. I believe M-pesa will increase my control over how I send and receive money.							
8. I believe M-pesa will be confusing to use.							
9. It would take a lot of time and effort for me to switch to M-pesa.							
10. Using M-pesa would require lots of effort.							
11. I believe that using M-pesa will help me send or receive money whenever I need.							
12. I believe M-pesa is very easy to use.							
13. It would be a hassle for me to start using M-pesa.							
14. M-pesa is somewhat complicated to use.							
15. I would need a lot more information before making a decision to use M-pesa.							
16. Other ways I send and receive money are better than what M-pesa would provide me.							
17. For me, the cost in time and effort to switch to M-pesa is too great.							
18. I am happy with how I send and receive money without M-pesa.							
19. My current way of sending and receiving money provides me with particular privileges that I would not receive if I use M-pesa.							
20. For me, the cost in money to use M-pesa is too high.							
21. I have certain needs for sending or receiving money that will not be met if I use M-pesa.							
22. I am scared of losing money if I use M-pesa.							
23. I do not think that I will benefit much from using M-pesa.							
24. I do not yet trust M-pesa.							

For each statement, please select <u>one</u> response that best matches your level of agreement.	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
25. I do not think M-pesa is a very secure way to work with money.							
26. If I started to use M-pesa, I would lose connections with my other services for sending and receiving money.							
27. I am not sure what the level of service would be if I switched to using M-pesa.							
28. If I were to use M-pesa, the service I might receive could be worse than what I get now.							
29. Before I could properly use M-pesa, I would first have to spend a lot of time learning to do new things with my mobile phone.							
30. I am not sure that M-pesa is as reliable as my current way of sending and receiving money.							
31. M-pesa is not much more convenient than my current way of sending and receiving money.							
32. Before I could properly use M-pesa, I would have to spend a lot of time learning how M-pesa works.							
33. I am not sure that M-pesa works as well as my current way of sending and receiving money.							
34. Overall, I have spent a lot of time and effort setting up the current way I send and receive money without M-pesa.							
35. Starting to use M-pesa would require me to show the people that I send money to (receive money from) how it works.							
36. I could probably only use M-pesa if I could call someone for help if I got stuck.							
37. Starting to use M-pesa takes a lot of time and effort.							
38. Overall, I have spent a lot of time and effort to build a relationship with the people/service I use to send and receive money.							
39. I am unlikely to use M-pesa in the near future.							
40. My friends think I should use M-pesa.							
41. My family/relatives think I should use M-pesa.							
42. People in my community will probably help me to use M-pesa.							
43. In general, people in my community support the use of M-pesa.							

For each statement, please select one response that best matches your level of agreement.	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
44. I could probably only use M-pesa if I had seen someone else use it before.							
45. Overall, I have spent a lot of time and effort to learn how I can send and receive money without using M-pesa.							
46. Right now, I have no plans to use M-pesa.							
47. I could only use M-pesa if I used a similar system before to send/receive money.							
48. I intend to use M-pesa when next I need to send money.							
49. I intend to use M-pesa when next I need to receive money.							
50. For products I can buy with M-pesa, I intend to completely switch over to M-pesa.							
51. I would prefer to use M-pesa for my transactions than any other services.							
52. I could only use M-pesa if someone helped me get started.							
53. There would be much time and effort involved to start using M-pesa.							
54. I will think about using M-pesa when next I need to send or receive money.							

I currently use M-pesa for (tick only one):

Most of my transactions ☐

Some of my transactions ☐

Very few of my transactions ☐

OR I have never used it ☐

Gender

Male ☐

Female ☐

Age

Less than 18 years ☐

18-29 years ☐

30-39 years ☐

40-49 years ☐

50 and older ☐

Education

Primary School ☐

Some High School ☐

High School ☐

Post High School (certificate or diploma) ☐

Some University ☐

Bachelor's Degree ☐

Postgraduate Degree ☐

Other…… ☐

Income per annum

Less than KSH 100,000 ☐

Between KSH 101,000 - 200,000 ☐

Between KSH 201,000 - 300,000 ☐

Between KSH 301,000-400,000 ☐

Between KSH 401,000-500,000 ☐

More than KSH 500,000 ☐

Do you own a mobile phone?

Yes ☐

No ☐

Do you have a bank account?

Yes ☐

No ☐

Thank you for participating in this survey

Appendix B- Survey Instrument administered in South Africa

Participant Information Sheet

Introduction

Good day,

My name is Olam Osah and I am currently enrolled as a student at the University of the Witwatersrand, Johannesburg, in pursuit of a Master's degree in Information Systems. I am inviting you to participate in a survey which aims to collect data on understanding consumers' adoption intentions towards a mobile payment service (M-pesa).

This survey should take approximately 15-20 minutes to complete.

Should you be willing to participate in this survey, your responses will be used solely for research purposes. The questionnaire is completely anonymous and will not contain any information that could personally identify you. Should you consider participating in this survey, you will not be exposed to any harm or damage and your response will be confidential. This survey is voluntary and you may choose to opt out at any time without any loss of any benefits due to you.

This survey has been approved unconditionally by the University of the Witwatersrand, Johannesburg, Human Ethics Committee (Non-Medical), and the protocol number is: **H110704.**

Thank you for considering participating in this survey. Should you have any questions or should you wish to obtain a copy of the results, please contact me on: 078 774 3717 or email osah07@gmail.com

Olam Osah.

Division of Information Systems

School of Economic & Business Sciences

University of the Witwatersrand, Johannesburg.

Please indicate, by marking with an (x), the extent to which you agree with each of the following statements.

For each statement, please select <u>one</u> response that best matches your level of agreement.	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1. I believe that M-pesa will be useful for me.							
2. I believe that M-pesa will allow me to send or receive money from wherever I am.							
3. I believe that using M-pesa will reduce the time it takes me to send or receive money.							
4. Overall, I think M-pesa will be less expensive for me to send and receive money.							
5. I think M-pesa is very easy to understand.							
6. I believe M-pesa is very easy to use.							
7. I believe M-pesa will be confusing to use.							
8. I cannot afford the time to get the information to fully evaluate M-pesa.							
9. It takes too much time to get the information that I will need to evaluate M-pesa.							
10. It is tough to compare my current financial service provider to M-pesa.							
11. Switching to M-pesa would mean losing or replacing points, credits, services, and so on that I have accumulated with my current financial service provider.							
12. I will lose benefits of being a long-term customer if I leave my current financial service provider.							
13. I am scared of losing money if I use M-pesa.							
14. I don't think I will benefit much from using M-pesa.							
15. I do not yet trust M-pesa.							
16. Before I could properly use M-pesa, I would first have to spend a lot of time learning to do new things with my mobile phone.							
17. Before I could properly use M-pesa, I would have to spend a lot of time learning how M-pesa works.							
18. Getting used to how M-pesa works would be easy.							
19. Even after switching, it would take effort to "get up to speed" with M-pesa.							

For each statement, please select <u>one</u> response that best matches your level of agreement.	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
20. There is much involved in understanding M-pesa well.							
21. Switching to M-pesa involves an unpleasant process.							
22. It takes time to go through the steps of switching to M-pesa.							
23. The process of starting up with M-pesa is quick and easy.							
24. There are a lot of formalities involved in switching to use M-pesa.							
25. There would be much time and effort involved to start using M-pesa.							
26. I could probably only use M-pesa if I had seen someone else use it before.							
27. I could probably only use M-pesa if I could call someone for help if I got stuck.							
28. I could only use M-pesa if someone helped me get started.							
29. My friends think I should use M-pesa.							
30. My family/relatives think I should use M-pesa.							
31. In general, people in my community support the use of M-pesa.							
32. Significant time, energy, and effort went into building and maintaining the relationship with my current financial service provider.							
33. Overall, I have a significant investment in the relationship with my current financial service provider.							
34. All things considered, I have devoted significant resources into previous dealings with my current financial service provider.							
35. I have spent significant time and money with my current financial service provider.							
36. Overall, I have spent a lot of time and effort to learn how I can send and receive money without using M-pesa.							
37. I am not sure what the level of service would be if I switched to using M-pesa.							
38. If I were to use M-pesa, the service I might receive could be worse than what I get now.							

For each statement, please select <u>one</u> response that best matches your level of agreement.	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
39. I am not sure that M-pesa works as well as my current way of sending and receiving money.							
40. I am not sure that M-pesa is as reliable as my current way of sending and receiving money.							
41. M-pesa is not much more convenient than my current way of sending and receiving money.							
42. I intend to use M-pesa when next I need to send money.							
43. I intend to use M-pesa when next I need to receive money.							
44. I will think about using M-pesa when next I need to send or receive money.							
45. I am very likely to use M-pesa in the next six months.							

I currently use M-pesa for (tick only one):

Most of my transactions ☐

Some of my transactions ☐

Very few of my transactions ☐

OR I have never used it ☐

Gender

Male ☐

Female ☐

Age

Less than 18 years ☐

18-29 years ☐

30-39 years ☐

40-49 years ☐

50 and older ☐

Education

Primary School ☐

Some High School ☐

High School ☐

Post High School (certificate or diploma) ☐

Some University ☐

Bachelor's Degree ☐

Postgraduate Degree ☐

Other…… ☐

Income per annum

Less than R10, 000 ☐

Between R10, 000- 30,000 ☐

Between R 31,000 - 60,000 ☐

Between R 61,000-90,000 ☐

Between R91, 000-120,000 ☐

More than R 120,000 ☐

Do you own a mobile phone?

Yes ☐

No ☐

Do you have a bank account?

Yes ☐

No ☐

Thank you for participating in this survey.

Appendix C- Items per Construct

C 1- Survey Instrument administered in Kenya.

Construct	Abbreviations	Item Number	Questionnaire Items
Perceived Usefulness	PU1	1	I believe that M-pesa will be useful for me
	PU 2	2	I believe that M-pesa will allow me to send or receive money from wherever I am.
	PU 3	3	I believe that using M-pesa will reduce the time it takes to send or receive money.
	PU4	4	I believe that using M-pesa will make it easier for me to send or receive money.
	PU5	5	I believe M-pesa is very easy to use.
	PU6	6	Overall, I think using M-pesa will be less expensive for me to send and receive money.
	PU7	7	I believe M-pesa will increase my control over how I send and receive money.
Perceived Ease of Use	PEOU1	8	I believe M-pesa will be confusing to use.
	PEOU2	9	M-pesa is somewhat complicated to use.
	PEOU3	10	Using M-pesa would require lots of effort.
	PEOU4	11	I think M-pesa is very easy to understand.
	PEOU5	12	I believe M-pesa is very easy to use.
Evaluation Cost	ECOST1	13	It would be a hassle for me to start using M-pesa.
	ECOST2	14	It would take a lot of time and effort for me to switch to M-pesa.
	ECOST3	15	I would need a lot more information before making a switch to use M-pesa.
	ECOST4	16	For me, the cost in money to use M-pesa is too high.
	ECOST5	17	For me, the cost in time and effort to switch to M-pesa is too

			great.
Lost Performance	LP1	18	I am happy with how I send and receive money without M-pesa.
	LP2	19	My current way of sending and receiving money provides me with particular previleges that I would not receive if I use M-pesa.
	LP3	20	Other way I send and receive money are better than what M-pesa would provide me.
	LP4	21	I have certain needs for sending and receiving money that will not be met if I use M-pesa
	LP5	22	I am scared of losing money if I use M-pesa.
	LP6	23	I do not think that I will benefit much from using M-pesa.
	LP7	24	I do not yet trust M-pesa
	LP8	25	I do not think M-pesa is a very secure way to work with money.
	LP9	26	If I started to use M-pesa, I would lose connections with my other services for sending and receiving money.
Uncertainty Cost	UC1	27	I am not sure what the level of service would be if I switched to using M-pesa.
	UC2	28	If I were to use M-pesa, the service I might receive could be worse than what I get now.
	UC3	29	I am not sure that M-pesa works as well as my current way of sending and receiving money.
	UC4	30	I am not sure that M-pesa is as reliable as my current way of sending and receiving money.
	UC5	31	M-pesa is not much more convenient than my current way of sending and receiving money.
Sunk Cost	SC1	32	Overall, I have spent a lot of time and effort setting up the current way that I send and receive money without M-pesa.
	SC2	33	Overall, I have spent a lot of time and effort to build a relationship with the people/service I use to send and

			receive money.
	SC3	34	Overall, I have spent a lot of time and effort to learn how I can send and receive money without using M-pesa.
Setup Cost	SETCOST1	35	Starting to sue M-pesa would require me to show the people that I send money to (receive money from) how it works.
	SETCOST2	36	Starting to use M-pesa takes a lot of time and effort.
	SETCOST3	37	There would be much time and effort involved to start using M-pesa.
Post-switching Behavioural and Cognitive Cost	PSBC1	38	Before I could properly use M-pesa, I would first have to spend a lot of time learning to do new thing with my mobile phone.
	PSBC2	39	Before I could properly use M-pesa, I would have to spend a lot of time learning how M-pesa works.
Subjective Norm	SN1	40	My friends think I should use M-pesa.
	SN2	41	My family/relatives think I should use M-pesa.
	SN3	42	People in my community will probably help me to use M-pesa.
	SN4	43	In general, people in my community support the use of M-pesa.
Self-Efficacy	SE1	44	I could probably only use M-pesa if I had seen someone else use it before.
	SE2	45	I could probably only use M-pesa if I could call someone for help if I got stuck.
	SE3	46	I could only use M-pesa if someone helped me get started.
	SE4	47	I could only use M-pesa if I used a similar system before to send/receive money.
Intention to Use	INT1	48	I intend to use M-pesa when next I need to send money.
	INT2	49	I intend to use M-pesa when next I need to receive money.

	INT3	50	For products I can buy with M-esa, I intend to completely switch over.
	INT4	51	I would prefer to use M-pesa for my transactions than other services.
	INT5	52	Right now, I have no plans to use M-pesa.
	INT6	53	I am unlikely to use M-pesa in the near future.
	INT7	54	I will think about using M-pesa when next I need to send or receive money.

C 2- Survey instrument administered in South Africa

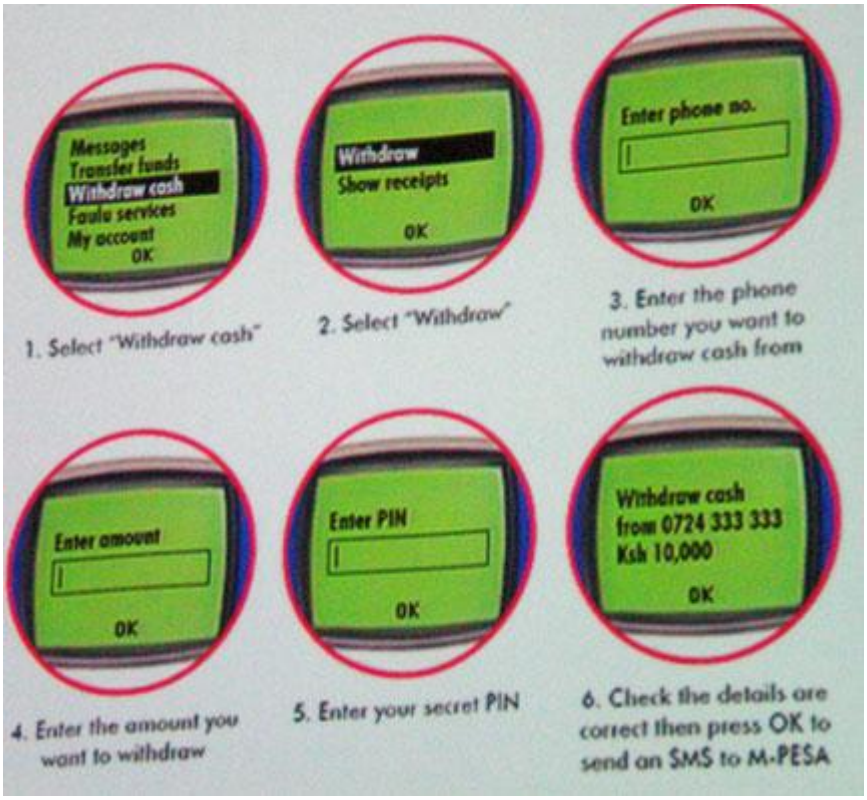
Construct	Abbreviations	Item Number	Questionnaire Items
Perceived Usefulness	PU1	1	I believe that M-pesa will be useful for me
	PU 2	2	I believe that M-pesa will allow me to send or receive money from wherever I am.
	PU 3	3	I believe that using M-pesa will reduce the time it takes to send or receive money.
	PU4	4	Overall, I think using M-pesa will be less expensive for me to send and receive money.
Perceived Ease of Use	PEOU1	5	I think M-pesa is very easy to use.
	PEOU2	6	I believe M-pesa is very easy to use.
	PEOU3	7	I believe M-pesa will be confusing to use.
Evaluation Cost	ECOST1	8	I cannot afford the time to get the information to fully evaluate M-pesa.
	ECOST2	9	It takes too much time to get the information that I will need to evaluate M-pesa.
	ECOST3	10	It is tough to compare my current financial service provider to M-pesa.
Lost Performance	LP1	11	Switching to M-pesa would mean losing or replacing points, credits, services, and so on that I have accumulated with my current financial service provider.
	LP2	12	I will lose benefits of being a long-term customer if I leave my current financial service provider.
	LP3	13	I am scared of losing money if I use M-pesa.
	LP4	14	I do not yet trust M-pesa.
	LP5	15	Before I could properly use M-pesa, I would first have to spend a lot of time learning to do new things with my mobile phone.
Uncertainty Cost	UC1	16	I am not sure what the level of service would be if I switched to

			using M-pesa.
	UC2	17	If I were to use M-pesa, the service I might receive could be worse than what I get now.
	UC3	18	I am not sure that M-pesa works as well as my current way of sending and receiving money.
	UC4	19	I am not sure that M-pesa is as reliable as my current way of sending and receiving money.
	UC5	20	M-pesa is not much more convenient than my current way of sending and receiving money.
Sunk Cost	SC1	21	Significant time, energy, and effort went into building and maintaining the relationship with my current financial service provider.
	SC2	22	Overall, I have a significant investment in the relationship with my current financial service provider.
	SC3	23	All things considered, I have devoted significant resources into previous dealings with my current financial service provider.
	SC4	24	I have spent significant time and money with my current financial service provider.
	SC5	25	Overall, I have spent a lot of time and effort to learn how I can send and receive money without using M-pesa.
Setup Cost	SETCOST1	26	Switching to M-pesa involves an unpleasant sales process.
	SETCOST2	27	It takes time to go through the steps of switching to M-pesa.
	SETCOST3	28	The process of starting up with M-pesa is quick and easy
	SETCOST4	29	There are a lot of formalities involved in using M-pesa.
	SETCOST5	30	There would be much time and effort involved to start using M-pesa.
Post-switching Behavioural and	PSBC1	31	Before I could properly use M-pesa, I would first have to spend a lot of time learning to do new

Cognitive Cost			things with my mobile phone.
	PSBC2	32	Before I could properly use M-pesa, I would have to spend a lot of time learning how M-pesa works.
	PSBC3	33	Getting used to how M-pesa works would be easy
	PSBC4	34	Even after switching, it would take effort to "get up to speed" with M-pesa.
	PSBC5	35	There is much involved in understanding M-pesa well.
Subjective Norm	SN1	36	My friends think I should use M-pesa.
	SN2	37	My family/relatives think I should use M-pesa.
	SN3	38	In general, people in my community support the use of M-pesa.
Self-Efficacy	SE1	39	I could probably only use M-pesa if I had seen someone else use it before.
	SE2	40	I could probably only use M-pesa if I could call someone for help if I got stuck.
	SE3	41	I could only use M-pesa if someone helped me get started.
Intention to Use	INT1	42	I intend to use M-pesa when next I need to send money.
	INT2	43	I intend to use M-pesa when next I need to receive money.
	INT3	44	I will think about using M-pesa when next I need to send or receive money.
	INT4	45	I am very likely to use M-pesa in the next six months.

Appendix D- Interfaces of M-pesa

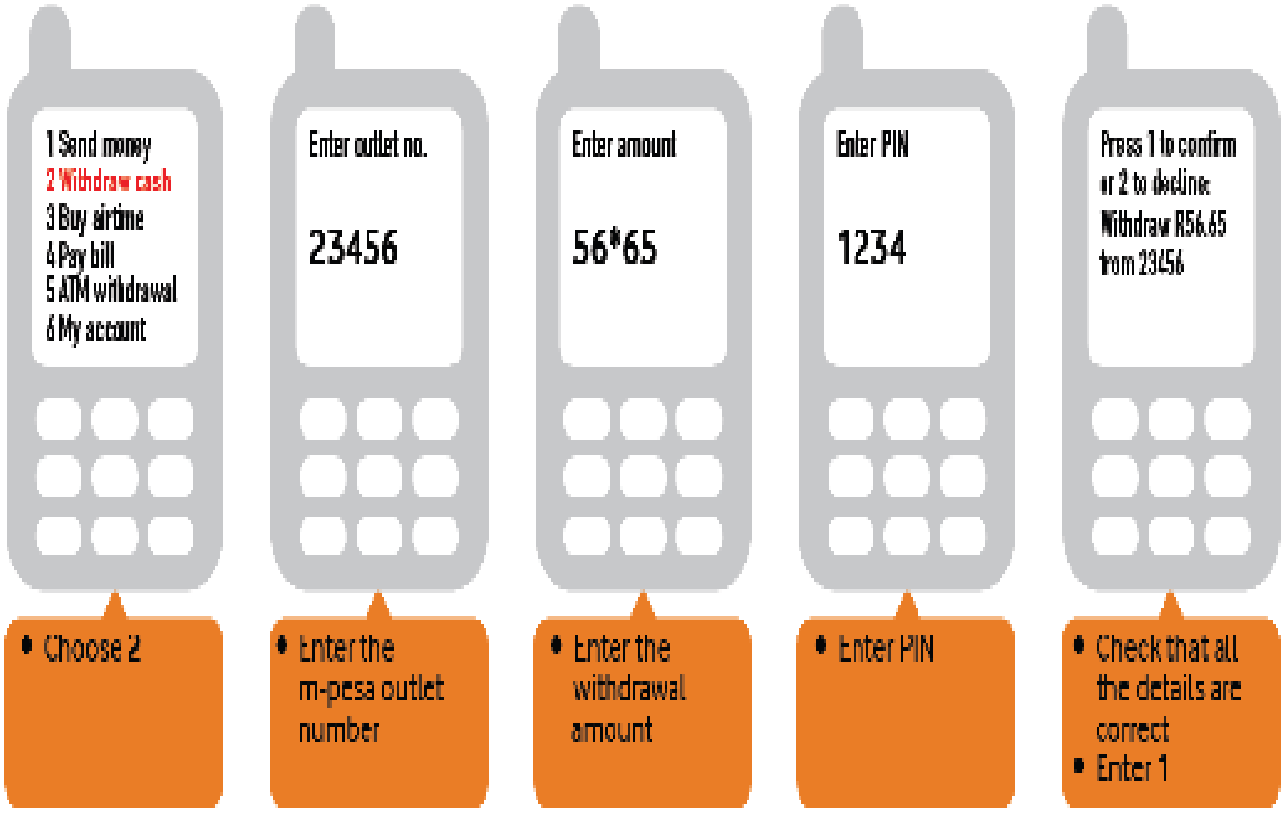
D1 Kenya- SIM Toolkit







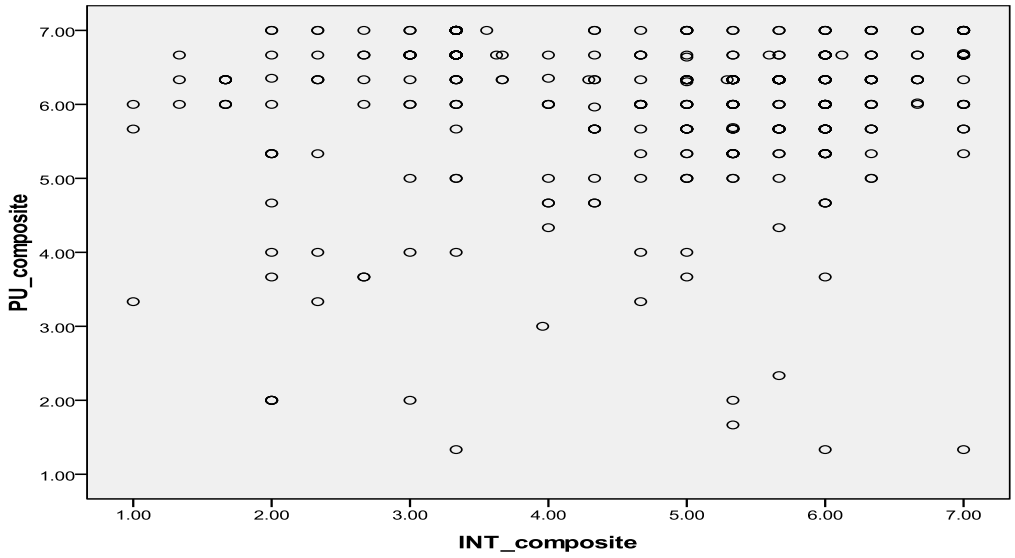
D2- South Africa- USSD

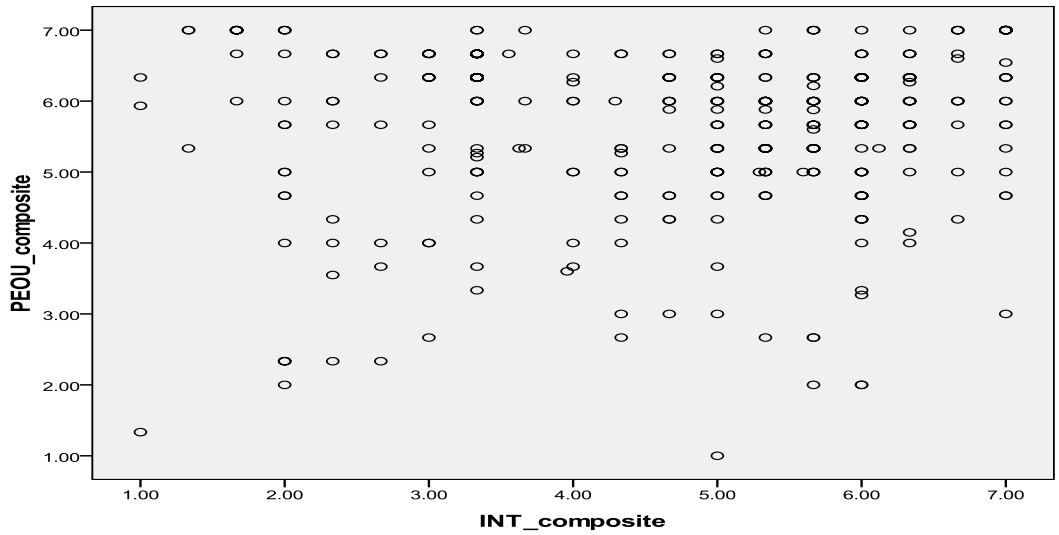


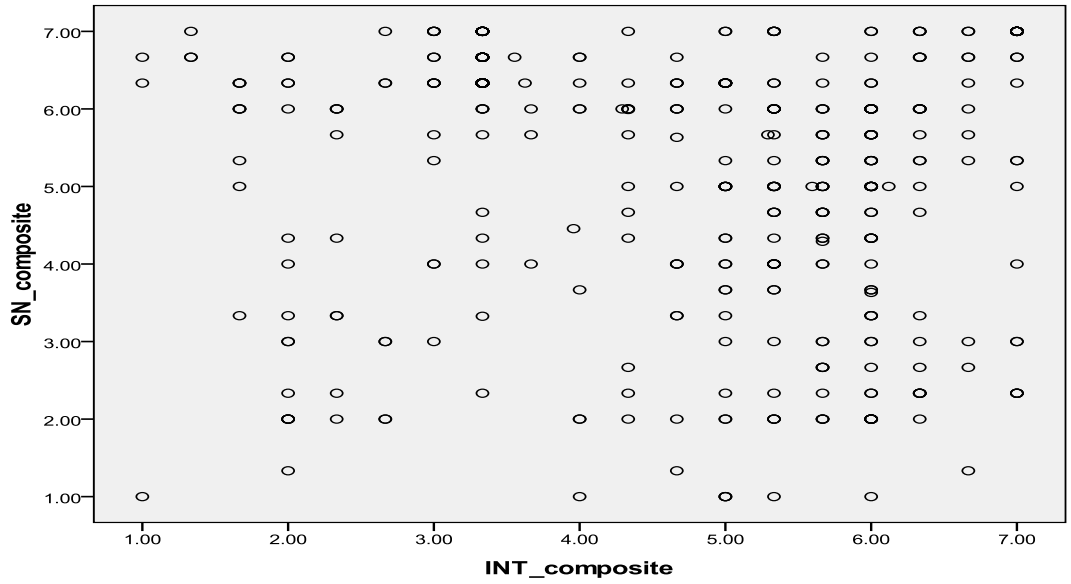
Appendix E- Mann Whitney U-Test

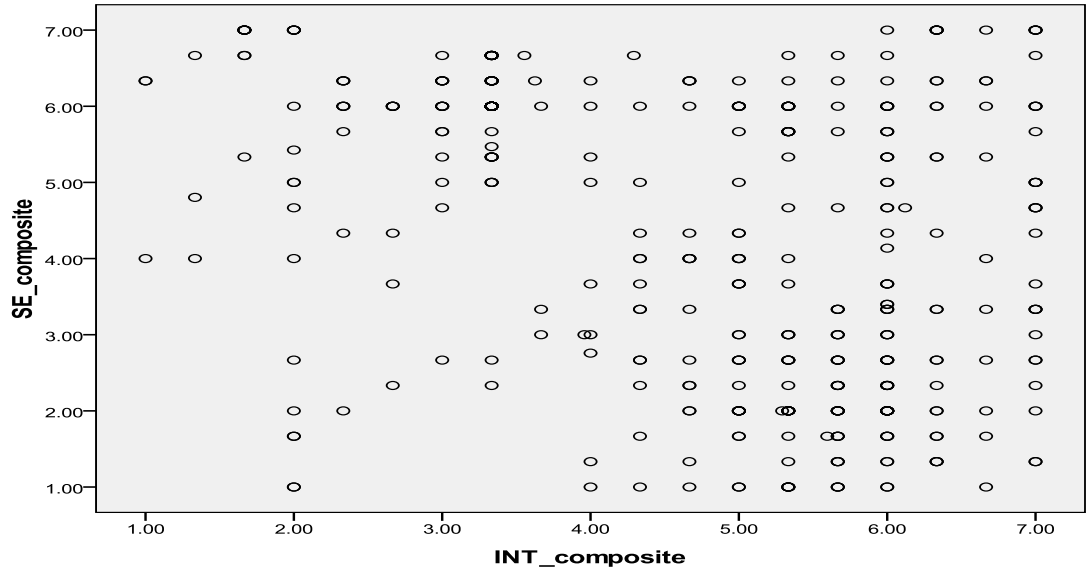
Mann Whitney U-test					Mann Whitney U-test	Wilcoxon	Median			Z	Asym p.Sig. (2-tailed)
Variable	**Context**	**N**	**Mean Rank**	**Sum of Ranks**			**Median**	**>Median**	**<=Median**		
		410									
PU	Kenya	263	233.67	61454.00	12186.000	23212.000	6.3333	127	136	-6.372	.000
	South Africa	148	156.84	23212.00				28	120		
PEOU	Kenya	263	238.55	62739.50	10900.500	21926.500	6.0000	151	112	-7.459	.000
	South Africa	148	148.15	21926.50				27	121		
SN	Kenya	263	238.15	62633.00	11006.000	22032.000	5.6667	166	97	-7.351	.000
	South Africa	148	148.87	22032.00				36	112		
SE	Kenya	263	260.60	68537.50	5102.500	16128.500	4.6667	180	83	-12.488	.000
	South Africa	148	108.98	16128.50				22	126		
LP	Kenya	263	158.87	41782.00	7066.000	41782.000	2.5000	76	187	-10.805	.000
	South Africa	148	289.76	42884.00				122	26		
UCOST	Kenya	263	144.97	38128.00	3412.000	38128.000	3.5000	47	216	-14.043	.000
	South Africa	148	314.45	46538.00				131	17		
PSBC	Kenya	263	151.97	39967.00	5251.000	39967.000	4.0000	32	231	-12.397	.000
	South Africa	148	302.02	44699.00				119	29		
INT	Kenya	263	181.63	47769.50	13053.500	47769.500	5.0000	92	171	-5.576	.000
	South Africa	148	249.30	36896.50				104	44		

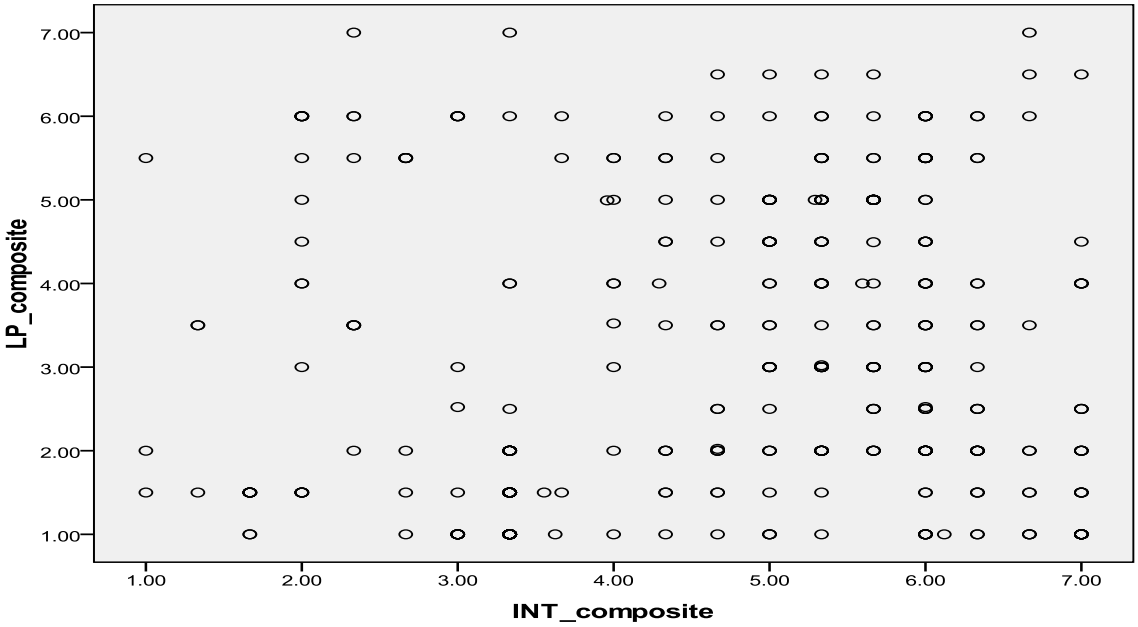
Appendix F- Scatter Plots

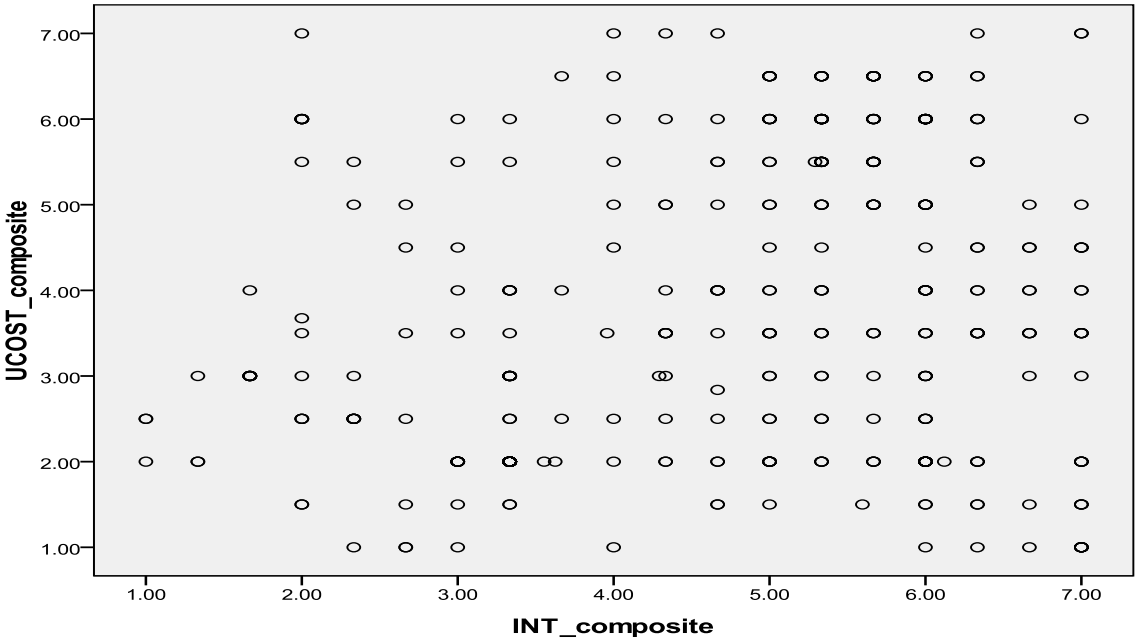


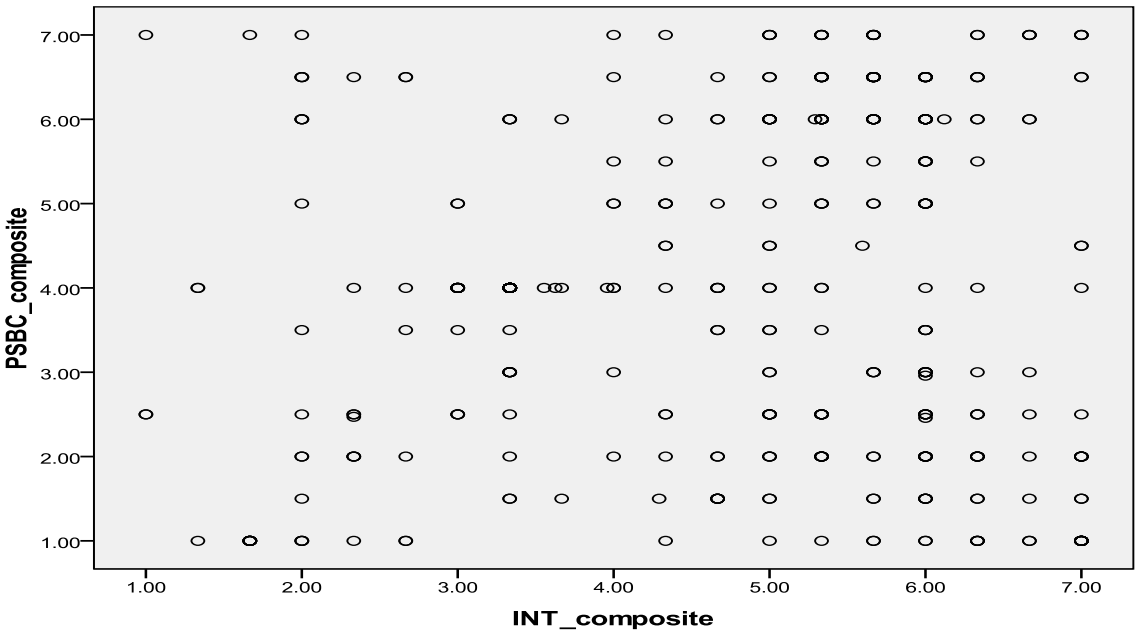



SN_composite
7.00
6.00
5.00
4.00
3.00
2.00
1.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
INT_composite

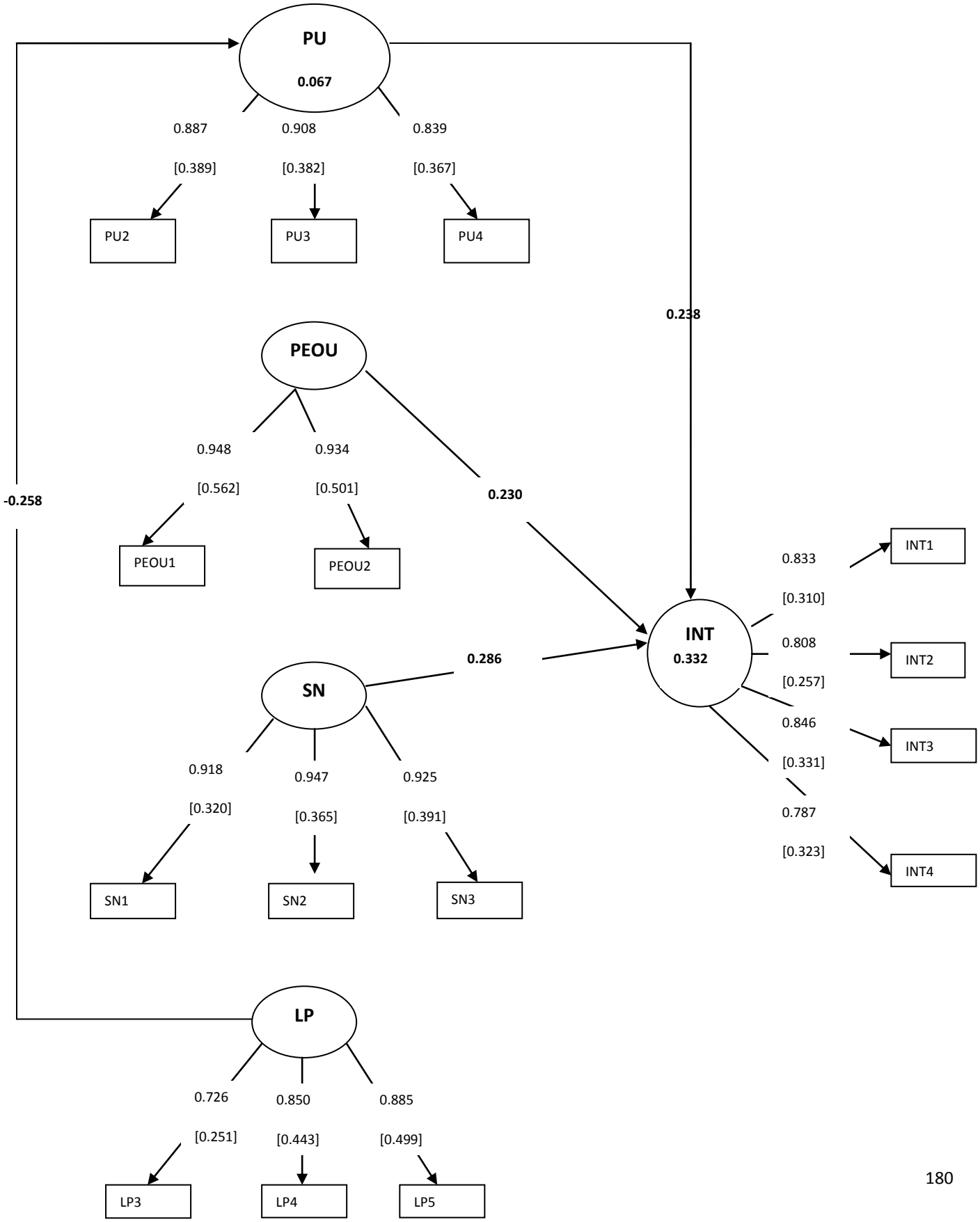

SE_composite
7.00
6.00
5.00
4.00
3.00
2.00
1.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
INT_composite


LP_composite
7.00
6.00
5.00
4.00
3.00
2.00
1.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
INT_composite


UCOST_composite
7.00
6.00
5.00
4.00
3.00
2.00
1.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
INT_composite


PSBC_composite
7.00
6.00
5.00
4.00
3.00
2.00
1.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
INT_composite

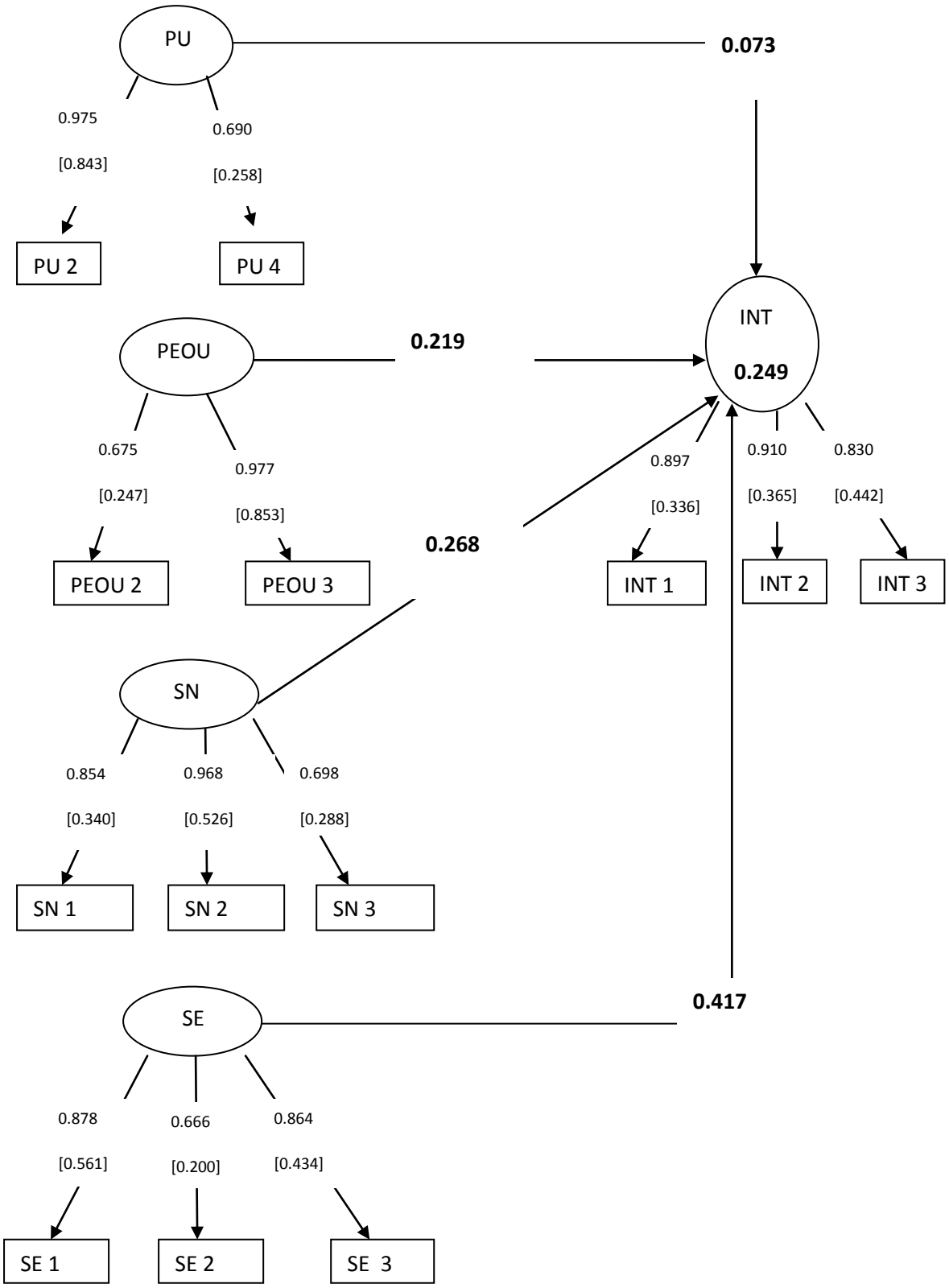
Appendix G- PLS graph model for revised model



The table below shows the path coefficients and t-statistics for lost performance and perceived usefulness.

Dependent -	**INT**	**PU**	**LP**
Sample Estimate	*INT*	0.2880	-0.2580
Mean of Subsamples	*INT*	2.367	-0.2705
Standard Error	*INT*	0.1125	0.0774
T-Statistics	*INT*	2.1157	3.3326

Appendix H- PLS graph model for Kenya



Appendix I- Ethics Clearance Certificate

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON MEDICAL)
R14/49 Osah

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER H110704**
PROJECT TITLE	Exploring consumers' intention to use the M-pesa financial service: a comparative study of low income communities in Kenya and South Africa
INVESTIGATOR(S)	Mr O Osah
SCHOOL/DEPARTMENT	Economics and Business Science/Information Systems
DATE CONSIDERED	2011/07/15
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	2013/07/17
DATE 2011/07/18	**CHAIRPERSON** pp (Professor R Thornton)

cc: Supervisor : Professor J Cohen

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

_____ ____/____/____

Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES