

https://dspace.org/

Factors Influencing the Consumer Usage of

Le Roux, Mitchell Thomas

2011-05-11
http://hdl.handle.net/10539/9725

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

Factors Influencing the Consumer Usage of Internet Banking in South Africa.

Mitchell Thomas Le Roux

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2009

ABSTRACT

This study is concerned with identifying the relevant factors that currently influence the consumer usage of internet banking in South Africa.

The study determines if there has been any change in the factor structure due to the rapid diffusion of the Internet and the rapid growth of internet banking users in South Africa. The Theory of Planned Behaviour and the Adoption of the Diffusion of Innovations Theory formed the conceptual framework to understand the consumer usage of internet banking and helped to identify the relevant factors investigated in this research.

179 valid responses were collected through an online survey and a combination of principal component analysis and multiple regression techniques were used to analyse the numerical ordinal data. A valid factor structure was formulated for the current internet banking consumer in South Africa.

Relative advantage, compatibility and trialability of the service were identified as significant promoting factors. A new factor labelled as introductory experiences was confirmed as a promoting factor. Security issues and complexity were confirmed as significant inhibitory factors. Cost, awareness, accessibility, user self-efficacy and the presence of support structures and website information could not be confirmed as factors.

A comparison made between the factor structure found by Hoppe, Mugera and Newman (2001) in South Africa and the one formulated in this research report showed similar results with the exception of self-efficacy and support structures not being confirmed as significant positive factors. No other substantial differences were observed.

DECLARATION

I, Mitchell Thomas Le Roux, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Mitchell Thomas Le Roux

Signed at the University of the Witwatersrand

On the …….. day of ……. 2009

DEDICATION

I would like to express my sincere appreciation to the support and encouragement given to me by my mother, Jean Le Roux, during this process. The encouragement was invaluable and made a big difference in the culmination of the research report.

I would also like to thank David, Gary, Wilfred and Wayne for their continuous support in my endeavours.

ACKNOWLEDGEMENTS

I wish to extend my sincere appreciation to Yvonne Saini for her guidance during the research.

I furthermore wish to thank Dr. Anthony Stacey for his technical and analytical insights into the methodological part of the research.

I would also like to thank Dr. Terry Carmichael for the assistance with the advice on formatting used in the research document.

I also wish to thank the respondents of the survey for their time and interest in completing the questionnaire.

TABLE OF CONTENTS

ABSTRACT II

DECLARATION III

DEDICATION IV

ACKNOWLEDGEMENTS V

LIST OF TABLES IX

LIST OF FIGURES X

CHAPTER 1: INTRODUCTION 1

1.1 PURPOSE OF THE STUDY 1
1.2 CONTEXT OF THE STUDY 2
1.3 PROBLEM STATEMENT 3
1.3.1 MAIN PROBLEM 3
1.3.2 SUB-PROBLEMS 4
1.4 SIGNIFICANCE OF THE STUDY 4
1.5 DELIMITATIONS OF THE STUDY 5
1.6 DEFINITION OF TERMS 6

CHAPTER 2: LITERATURE REVIEW 7

2.1 INTRODUCTION 7
2.2 THE CONTEXT OF BANKING IN SOUTH AFRICA 7
2.2.1 BANKING IN SOUTH AFRICA 7
2.2.2 INTERNET CONNECTIVITY IN SOUTH AFRICA 10
2.2.3 INTERNET BANKING IN SOUTH AFRICA 14
2.3 THEORETICAL BASE FOR ADOPTION OF NEW TECHNOLOGIES 16
2.4 FACTORS INFLUENCING THE USE OF INTERNET BANKING 21
2.4.1 ATTENTION AND AWARENESS 21
2.4.2 RELATIVE ADVANTAGE 23
2.4.3 ACCESSIBILITY 25
2.4.4 COMPATIBILITY 26
2.4.5 COMPLEXITY (USABILITY) 27
2.4.6 TRIALABILITY 29
2.4.7 RISK (SECURITY, TRUST AND PRIVACY) 30
2.4.8 COST IN RELATION TO BENEFITS 33
2.4.9 SELF-EFFICACY 34
2.4.10 SUPPORT STRUCTURES 35
2.5 SUBJECTIVE NORMS. 37

2.6 THE FIRST SOUTH AFRICAN STUDY ON FACTORS EFFECTING INTERNET BANKING CONSUMERS BY HOPPE, MUGERA AND NEWMAN (2001) 38
2.7 CONCLUSION OF THE LITERATURE REVIEW 41

CHAPTER 3: RESEARCH METHODOLOGY 43

3.1 INTRODUCTION 43
3.2 RESEARCH METHODOLOGY /PARADIGM 43
3.3 RESEARCH DESIGN 43
3.4 POPULATION AND SAMPLE 44
3.4.1 POPULATION 44
3.4.2 SAMPLE AND SAMPLING METHOD 44
3.5 THE RESEARCH INSTRUMENT 45
3.6 PROCEDURE FOR DATA COLLECTION 46
3.7 DATA ANALYSIS AND INTERPRETATION 46
3.7.1 OVERVIEW 47
3.7.2 FORMULATION OF THE STATEMENTS 47
3.7.3 DETERMINATION OF THE OPTIMAL NUMBER OF FACTORS 48
3.7.4 GENERATION OF THE CORRELATION MATRIX 48
3.7.5 INTERPRETATION OF THE FACTORS 48
3.7.6 COMPARISON OF FACTORS FOUND BY THIS STUDY TO THOSE FOUND BY HOPPE, MUGERA AND NEWMAN (2001) 49
3.8 LIMITATIONS OF THE STUDY 50
3.9 VALIDITY AND RELIABILITY 51
3.9.1 EXTERNAL VALIDITY 51
3.9.2 INTERNAL VALIDITY 51
3.9.3 RELIABILITY 52

CHAPTER 4: PRESENTATION OF RESULTS 53

4.1 INTRODUCTION 53
4.2 DEMOGRAPHIC PROFILE OF RESPONDENTS 53
4.3 RESULTS PERTAINING TO THE FORMULATION OF FACTORS 60
4.4 RESULTS PERTAINING TO DETERMINING WHETHER FACTORS ARE PROMOTING OR INHIBITORY 67
4.5 RESULTS PERTAINING TO THE COMPARISON OF THE FACTOR STRUCTURE FROM THIS STUDY TO THAT OF HOPPE, MUGERA AND NEWMAN (2001) 69
4.5 SUMMARY OF THE RESULTS 70

CHAPTER 5: DISCUSSION OF THE RESULTS 71

5.1 INTRODUCTION 71
5.2 DEMOGRAPHIC PROFILE OF RESPONDENTS 71
5.3 DISCUSSION PERTAINING TO PROMOTING FACTORS 72
5.3.1 RELATIVE ADVANTAGE AND COMPATIBILITY 72
5.3.2 TRIALABILITY 73
5.3.3 INTRODUCTORY EXPERIENCES 73

5.4 DISCUSSION PERTAINING TO INHIBITORY FACTORS 74
5.4.1 SECURITY ISSUES 74
5.4.2 COMPLEXITY 74
5.5 DISCUSSION PERTAINING TO THE REMAINING FACTOR CONSTRUCTS 75
5.5.1 SUPPORT STRUCTURES AND WEBSITE INFORMATION 75
5.5.2 SELF-EFFICACY 75
5.5.3 ATTENTION AND AWARENESS 76
5.5.4 COST 76
5.5.5 ACCESSIBILITY 76
5.5 DISCUSSION PERTAINING TO THE COMPARISON OF THE FACTOR STRUCTURE FROM THIS STUDY TO THAT OF HOPPE, MUGERA AND NEWMAN (2001) 77
5.6 CONCLUSION 78

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS 79

6.1 INTRODUCTION 79
6.2 CONCLUSIONS OF THE STUDY 79
6.3 RECOMMENDATIONS 80
6.4 SUGGESTIONS FOR FURTHER RESEARCH 82

REFERENCES 84

APPENDIX A: LETTERS TO FIN 24 AND BANK SETA 92

APPENDIX B: FINAL ONLINE QUESTIONNAIRE 93

APPENDIX C: QUANTITATIVE DATA 100

APPENDIX D: CONSISTENCY MATRIX 110

LIST OF TABLES

Table 1: Internet Usage and Population Statistics in South Africa (Source: World Wide Worx 2007)……12

Table 2: Internet Usage in South Africa in 2007 (Source: Nielsen/Netratings 2007)……13

Table 3: International Online Banking Use 2000 – 2004 (Source: Higa 2005)……14

Table 4: Summary of Factors influencing Internet Banking ……41

Table 5: Demographic Profile of Respondents……54

Table 6: Items coded to specific factors with corresponding statements……61

Table 7: Items and Corresponding Factor Loadings……63

Table 8: Reliability Tests……64

Table 9: Factor Structure for Internet Banking in South Africa……66

Table 10: Multiple Regression Analysis……67

Table 11: Comparison of Factor Structures……69

LIST OF FIGURES

Figure 1: Market Shares for South African Banks (Standard Bank 2006)……..8

Figure 2: Theory of Planned Behaviour (Ajzen and Fishbein 1985)……..17

Figure 3: Framework for the Use of Internet Banking (Tan and Teo, 2000)……..18

Figure 4: Lichtenstein's Framework showing Key Factors in Consumer Usage of Internet Banking (Lichtenstein 2006)……20

Figure 5: Graphical Representation of Age Demographics……55

Figure 6: Graphical Representation of Monthly Income Demographics……56

Figure 7: Graphical Representation of Education Demographics…....57

Figure 8: Graphical Representation of Employment Demographics….58

Figure 9: Degree to which Respondents regard themselves as Active Users……59

Figure 10: Active versus Inactive Users……..60

CHAPTER 1: INTRODUCTION

1.1 Purpose of the study

The purpose of this study is to determine the factors that currently influence consumers of internet banking in South Africa. The development of the Internet and the technologies surrounding it has influenced the manner in which consumers manage their banking needs. Electronic banking can be viewed as a revolutionary innovation and is seen as one of the most successful business-to-consumer applications in electronic commerce (Pousttchi 2004). The rapidly expanding use of the Internet in South Africa makes the behaviour of those who use internet banking more important to service providers. The behaviour of consumers of this alternate banking channel need to be better understood if banks are to take full advantage of the opportunities offered by this market.

There is a huge demographic divide between those who are comfortable using computers and have access to the internet and those people who do not (Brown 2004a). Internet banking was more likely to be utilised by those with higher educational levels as well as those in higher socio-economic demographic. They tend to be well–educated and affluent, with the highest use found in the population between the ages of 28 and 39 (Higa 2005). In South Africa, Brown (2004b) noted that the banking needs a nd the demographic composition of those consumers who used internet banking were shown to be generally different from those consumers who only used traditional brick and mortar banking.

The number of consumers with access to the Internet in South Africa has dramatically changed since 2000. According to the World Wide Worx (2006) the number of people with access to the Internet has increased from 2,4 million in 2000 to 5,1 million in 2006. In comparison, the general population in South Africa only increased by approximately 10% over the same period. Penetration of the Internet into the general population has also increased from 5,5% in 2000 to over 10% in 2006. This means that 1 in every 12 people in the country are

deemed to have access to the Internet and the benefits it can provide. This signals a potential overflow or shift into other demographic groups.

Greater internet penetration, advances in technology with faster internet connections and continually evolving online security applications demonstrate the dynamic landscape. With regard to internet banking, ongoing advances in technology and the growth of the Internet are introducing an increase in the number of challenges for both financial organisations and consumers (Rosado, Gutiérrez and Piattini 2006). These dynamic technological advances, coupled with new internet banking products which are now much broader and continually subject to innovative development (Hway-Boon and Yu 2003), is making internet banking more appealing and accessible to a wider demographic than previously thought. In South Africa, the changing internet user demographics, as well as advancing internet and banking technologies, can affect the factors that influence consumers of internet banking.

Reasons stated for decreased internet banking use by consumers are varied and associated with uncertainty about the security of transactions, registration for the service perceived to be a hassle, internet banking viewed as complicated to use, a need to be able to talk to staff and the perception that internet banking only offers a limited service (Chung 2002). The abovementioned internet banking issues relate to factors like risk, relative advantage, usability and the presence of effective support structures which are regarded as important. Other factors like compatibility, trialabilty, complexity and self-efficacy (Hoppe Mugera and Newman 2001) were also found to be contributory.

1.2 Context of the study

This study will re-examine the factors that affect consumer usage of internet banking in South Africa as identified by Hoppe, Mugera and Newman (2001). The focus and purpose of this study aims to ascertain whether any of these factors have changed significantly. It also aims to determine if any other factors present in South Africa have been overlooked by Hoppe, Mugera and Newman

(2001). This will give an indication if any changes have occurred in the behaviour of internet banking consumers in South Africa since 2001 and if any potential advantage may exist for banking institutions to increase their marketing and customer service strategies.

Changes in technology have been highlighted as a major factor driving change within the South African banking industry (Price Waterhouse Coopers 2001). The factors which were present in 2001 can not be regarded as static and are subject to dynamic forces which control and shape the banking and technological developments within South Africa.

The factors that effect internet banking can also be influenced by parallel technologies and applications like cell phone banking. Cell phone banking is still in its infancy in South Africa but as this technology becomes more widespread it will influence how banking consumers perceive physical brick and mortar banks as well as banking systems that use remote technology like internet banking.

Consumers' perceptions are changing continually. To keep pace with the changing business environment and consumer buying behaviour, companies will need to evaluate how they do business on an ongoing basis and question whether their previous formula for success still applies (Drucker 1992).

1.3 Problem statement

1.3.1 Main problem

The purpose of the study is to identify if there has been a change in the factors that currently influence the consumer usage of internet banking in South Africa. The study will assess if there has been a change in the factor profile by comparing the current factor structure to that of the original study on factors effecting internet bankers done by Hoppe, Mugera and Newman (2001) in South Africa.

1.3.2 Sub-problems

The first sub-problem is to identify which distinct factors currently influence consumers of internet banking in South Africa. This entails determining which factors are promoting (positively influences) and which factors are inhibitory (negatively influences) the consumer usage of internet banking in South Africa.

The second sub-problem of the study is to make a comparison to the factor profile found in the original study by Hoppe, Mugera and Newman (2001) and this will give an indication if any changes have occurred.

The literature review will be guided by the frameworks compiled by Tan and Teo (2000) and Lichtenstein (2006) and the only previous study in South Africa on factors effecting internet banking consumers by Hoppe Mugera and Newman (2001).

1.4 Significance of the study

Most banking consumers continue to use multiple channels and some consumers even bank with more than one bank. Weeldreyer (2002) highlights that banks need to know who they are serving and what the needs, problems and financial priorities of their customers are. This study is important as it will provide useful information for both banking consumers and banking institutions.

This study will attempt to explore if the factors that accelerate or hinder the usage of internet banking have changed since 2001. This will help banking institutions understand how different consumer segments now view their internet banking services and can assist in identifying marketing approaches that will increase the penetration of their services in these markets. In depth knowledge of the organisation's customer base becomes part of its core competency, determined by the quality of consumer feedback, interaction and knowledge (Pralahad and Ramswamy 2000). This study should help to improve

customer service related issues of this alternate banking channel and thus improve services to the customers.

The results of this study should help marketing practitioners focus their efforts on specific attributes of internet banking and make their marketing campaigns more effective. Considering that the cost of acquiring a new customer in an e-commerce channel is often considerably higher than in traditional retail channels (Reicheld and Schefter 2000), banks must better understand how to expand their marketing initiatives to retain existing customers and at the same time attract new ones.

It will also be beneficial for individuals responsible for formulating the banking institution's strategy as the results will be informative when planning any new electronic initiatives. By identifying and taking full advantage of these opportunities it is possible to increase the bank's revenue.

1.5 Delimitations of the study

All respondents participating in the study are expected to have a full grasp of the English language and to communicate effectively and express their views accurately therein.

The study will only be concerned with the manner in which South African internet banking is viewed by the consumer. The study is restricted to those people who have internet access to their bank accounts in South Africa. There is no restriction placed on whether these accounts are accessed from outside the borders of South Africa. Individuals in other countries with internet access to their bank accounts here are still regarded as South African internet bank consumers.

No distinction is made between those individuals who already frequently use internet banking and those who rarely use internet banking services despite having internet access to their bank account.

1.6 Definition of terms

A factor can be regarded as an element or concept that actively contributes to the accomplishment of a certain result or process (Freedictionary 2008). To expand on this, a factor can also be regarded as any idea that is considered to be important to understanding a particular process. It is any parameter that helps to define a process and determines the limits of a system's performance.

Factors can be attitudinal, social or behavioural in nature:

- An attitude is a positive or negative feeling or mental state of readiness, learned and organized through experience, which exerts a specific influence on a person's response to people, objects and situations (Gibson, Ivancevich and Donnelly 2000).
- Social factors refer to social pressures which emanate from groups such as parents, friends and colleagues which either positively or negatively influence the behaviour in question (Fishbein and Ajzen 1975).
- Behavioural control factors encompass those features which exert an influence through artificial structures put into place to specifically regulate and control the choices an individual is allowed to make (Tan and Teo 2000).

In this report a factor refers to any significant element or concept that will influence an individual to continue or discontinue use internet banking.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The literature review will begin with an overview of the context of internet banking in South Africa. Some of the facets explored will include the banking infrastructure in South Africa, the state of internet connectivity and the current trends in internet banking in the country.

The literature review will then focus on the theoretical basis for the adoption and use of new technologies. This will entail an exploration of the constructs deemed important by the authors of innovation literature, and will investigate the nature of the factors that determine the consumer usage rate of internet banking. The frameworks compiled by Tan and Teo (2000) and Lichtenstein (2006) will be discussed to identify factors relevant to internet banking.

The literature review will end with a critique and discussion of the findings of the only previous study (Hoppe, Mugera and Newman 2001) done in South Africa pertaining to factors influencing consumers of internet banking.

2.2 The context of banking in South Africa

2.2.1 *Banking in South Africa*

Global integration, deregulation and advances in technologies are dramatically changing the structure and nature of financial services in an international context according to Shahrohki (2008). Financial service providers in developed countries have been tapping into opportunities in developing countries in Africa and have thus had increased contact with the South African banking infrastructure.

South Africa has a well developed financial sector. Banking is mostly controlled by the ‘Big Four’ banks which are Amalgamated Banks of South Africa (ABSA),

Standard Bank of South Africa, Nedbank and First National Bank (FNB). The 'Big Four' South African banks have significant scale, well focused strategies, are well organised and technologically advanced with products and services more akin to those found in developed markets than developing markets (Moody's Investors Service Banking System Outlook Report 2008). Local banks are highly regarded in the overseas markets as being progressive and up to date with current market trends.

According to Singh (2004) when examined closer it is found that market shares of the 'Big Four' change according to product category. One bank may have the highest market share in the home loan market and a lower market share in the credit card market. This phenomenon is demonstrated in Figure 1.

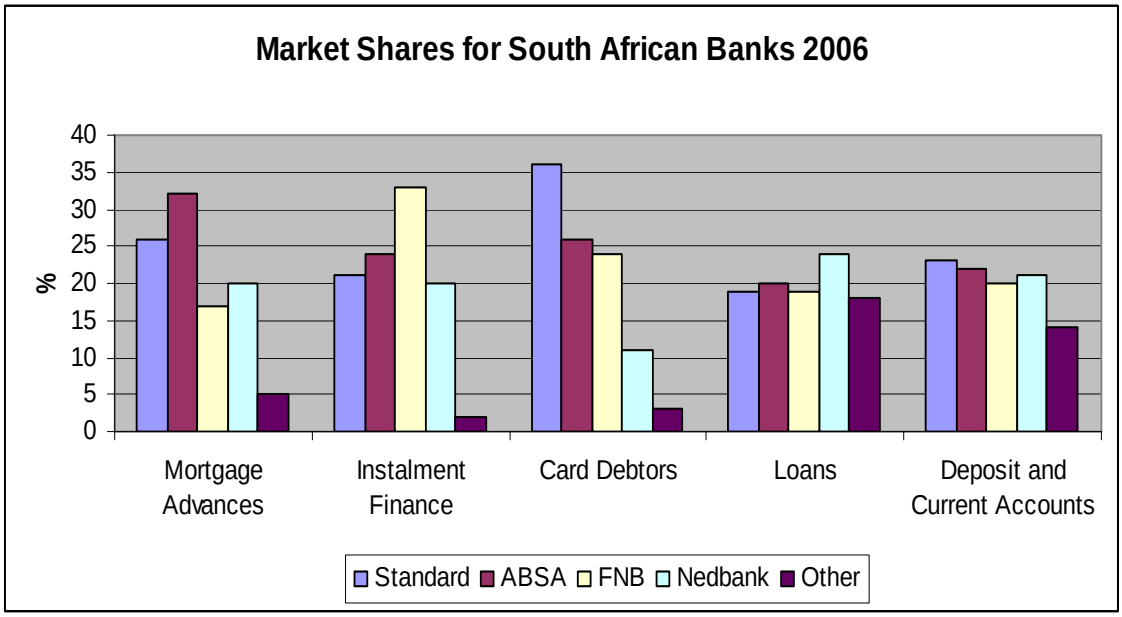


Figure 1. Market Shares for South African Banks (Standard Bank 2006).

Researchers at Deloitte confirmed that the various South African banks were well aware of their competitors' pricing strategies and policies and these banks monitored one another closely (Whitfield 2007). The report describes the South African Reserve Bank's investigation into whether a complex monopoly exists in the South African banking sector. This report suggested that while the major

banking institutions did not collude on pricing, they closely monitored one another's activities and were able to price accordingly.

Banking is a highly information intensive activity. In South Africa, the financial sector is heavily reliant on technology and banks have to keep abreast of any technological advances which have an influence on their banking and transactional systems. Through technology, banks are provided with an avenue to differentiate their services, and to improve this service they have to constantly make innovative changes to keep ahead of their competitors.

Modes of banking have progressed with the development of new technology. The first alternative channel was the automated teller machine (ATM). It was the clearly preferred mode for cash withdrawals but it is less favoured by customers for the use of cheques or cash deposits (Higa 2005). This was followed by telephone banking which allows customers to call a centralised number where they would interact with call-centre employees and conduct most of their banking transactions over the telephone. Banks also began to offer self-service terminals within banks which became the forerunner for other self-service technologies.

Additional avenues are being explored by banks in South Africa to provide banking services. This included a Nedbank initiative to offer banking through cash out tills in supermarkets with their Go Banking initiative in Pick 'n Pay supermarkets. The fees charged by the supermarket banking service were considerably lower than regular banking charges but clients were only allowed to carry out rudimentary banking tasks (Whitfield 2007).

The movement into the virtual world saw the development of remote internet and cell phone banking services. Cell phones were launched in South Africa in 1994 and cell phone banking has been available since 1998 (Brown 2003). The banks in South Africa are offering cell phone banking through Wireless Application Protocol (WAP) and Short Message Service (SMS) based technologies. This effectively means that clients do not only need a computer to perform remote banking - they can simply perform banking transactions on their cell phones. This is convenient during holiday seasons when travelling away

from home. In South Africa, cell phones cut across the socio-economic spectrum and are not restricted to an affluent or educated portion of the society. The rapid diffusion of cell phones offers a new and flexible channel for banking that offers clients the same or similar functionality as computer-based internet banking.

However, there has been a global trend which indicates that there is a clear resistance among non-users of cell phone banking to adopt these services. In a study by Laukkannen (2006) the reasons for resistance are divided into functional barriers and psychological barriers. Laukkannen (2006) concluded that resistance is strongly related to the usage experience of cell phone banking services and a feeling that cell phone banking services have not yet convinced banking customers of its usefulness and added value. Brown (2003) also states that another challenge that needs to be addressed is changing the perception of the cell phone as a communication device to a multi-purpose device that could be used to conduct financial transactions.

2.2.2 *Internet connectivity in South Africa*

Since the introduction of the Internet in 1969 it has evolved rapidly to become a popular medium for e-commerce. The Internet first became accessible to the South African public in 1994 (Goldstuck 2002). There was initially a rapid growth phase in the dial-up market which caused the number of internet service providers to increase. The arrival of broadband or high-speed internet access in South Africa has seen another turning point in the growth of the local internet market which is contributing to the transformation of the internet access landscape in the country.

In 2002, most internet users in South Africa were relatively well-educated and affluent. At that stage approximately 2.6-million internet users had dial-up access from their workplace, indicating that most internet users were relatively well-paid white-collar workers (Nielsen/Netratings 2002). Approximately 800 000 people had dial-up accounts at home or at small businesses. In

addition to these users there were those who accessed the Internet from internet cafes, WAP-enabled cell phones, and academic institutions. At this stage the South African internet community was viewed as still growing rapidly and had not yet reached maturity (Nielsen/Netratings 2002).

According to Nielsen/Netratings (2002) the use of internet banking showed a slight bias in favour of men over women, and a greater bias towards major urban centres in Gauteng and the Western Cape as opposed to rural areas and smaller cities. Internet users were regarded as being well-educated. The average South African internet user was in full-time (53%) or part-time (7%) employment or self-employed/contracting (15%). Only a relatively small number of internet users were unemployed (2%), homemakers (3%) or retired (1%). A high percentage of respondents (19%) were students.

In 2002 the continued growth in the South African internet market was uncertain as there were concerns that the growth in the local internet market may stall as it did in the USA and some European countries (Goldstuck 2005). After 2002, despite increased expectations, the growth of internet access among South African consumers had slowed down. This was due mainly to the dial-up market experiencing little growth in subscribers for the first time since the industry was launched in 1994 (Goldstuck 2005). This was minimally offset by increased corporate usage as well as the increased rates of broadband adoption.

Subsequently the penetration of the Internet in South Africa has almost doubled from 5.5% in 2000 to 10.3% in 2006. This rapid growth is illustrated in Table 1.

Table 1. Internet Usage and Population Statistics in South Africa

Year	Users	Population	%Penetration
2000	2,400,000	43,690,000	5,5
2001	2,750,000	44,409,700	6,2
2002	3,100,000	45,129,400	6,8
2003	3,283,000	45,919,200	7,1
2004	3,523,000	47,556,900	7,4
2005	3,600,000	48,861,805	7,4
2006	5,100,000	49,660,502	10,3

(Source: World Wide Worx 2007)

Wider access to broadband has boosted internet connectivity. Technologies like ADSL (Asymmetric Digital Subscriber Line**)** and 3G (Third Generation) enabled faster data transmission over copper telephone line access. There is currently an increasing uptake of broadband in South Africa, noticeable in increased marketing for the product and increased competition between internet service providers to capture the new market (World Wide Worx 2007). Bandwidth remains relatively limited and expensive in South Africa but it is expected that broadband access should decrease in price over time and show improvements in performance (Southafricainfo.com 2008). This will reduce the size of the dial-up market as many dial-up users migrate to the newer faster technology. Because of the cost, infrastructure and equipment requirements, dial-up connections are the preferred means to reach disadvantaged communities.

According to Goldstuck (2005) the growth in the South African internet market has slowly grown so that 1 in every 12 South Africans has access to the internet. He emphasizes the idea of having access should be clearly distinguished from actively using the Internet on a regular basis.

The results according to the latest Nielsen/Netratings (2007) gives an idea of who is currently using the internet in South Africa. Internet use, and therefore the use of internet banking in South Africa in 2002, were mostly concentrated amongst the affluent and the middle class with widespread access not being achieved. There has been a shift in the demographic profile of internet access since 2002 to include more people from less affluent backgrounds. The salient features present in 2007 are presented in Table 2.

Table 2. Internet Usage in South Africa in 2007

Aspect	Description
Demographic	• 51% of all online users are male and 49% female. • average age of our online users are between 25 – 29 • 47% are married • 25% live in households that have four members in them • 51% are English speaking, 28% are Afrikaans speaking and the balance speaks one of the official South African languages the highest being Zulu 6% and Xhosa 4%. • 31% live in Johannesburg, 18% in Cape Town, 14% in Pretoria and 8% in Durban
Location of access	• 64% access the internet from their place of work • 31% of all online users have internet access at home.
Education	• 25% of all online users have had some form of higher education since leaving school
Employment	• 61% are employed full time and work more than 30 hours a week • 20% hold clerical or administrative positions • 18% hold managerial positions • 15% of online users are either from the financial, insurance or real estate industry
Financial	• 53% own their own homes and have bonds • 17% have an annual household income of R400 000 or more, • 15% preferred to not say what their income was and • 10% earned less than R50 000 a year.
Miscellaneous	• 32% have satellite dishes • 61% of online users have cellular phones with Internet access

(Source: Nielsen/Netratings 2007)

2.2.3 *Internet banking in South Africa*

Internet banking started in 1990 when the Wells Fargo Bank, based in California USA, introduced the world's first online banking service (Higa 2005). It is currently regarded as a fully-fledged banking distribution channel with Table 3 showing some recent worldwide figures.

Table 3. International Online Banking Use 2000 – 2004

Region (millions of users)	**2000**	**2001**	**2002**	**2003**	**2004**
Western Europe	18.6	28	37.8	47.7	57.9
United States	9.9	14.7	17.1	20.4	22.8
Japan	2.5	6.5	11.9	19.6	21.8
Asia-Pacific (excl. Japan)	2.4	4.4	6.8	9.8	13.8
Rest of the World	1	1.7	3.1	5.1	6.1
Total	34.4	55.3	76.7	102.6	122.3

(Source: Higa 2005)

Internet banking was first launched in South Africa in 1996. ABSA was the first to offer online banking services and the other major banks soon followed suit. According to Bonorchis (2008) ABSA currently leads the internet banking market with over 1 million customers, while Standard Bank did not disclose their number of internet banking customers, they did report that by August 2008 their internet banking user numbers had increased by 19% over the preceding year. Nedbank and First National bank did not release the number of their internet bank users. Despite the large numbers of internet banking customers for local banks, Table 3 shows that South Africa (a subset of Rest of the World) had less than 5% of the total global of users in 2004.

In traditional banking, the interface is with a bank teller or an ATM. With internet banking the primary interaction is with a personal computer or laptop. The technology enables contact between banks and their customers to be established at any time from all over the world. The use of wireless technologies also affords a greater opportunity for customization and personalization to the

individual which has the potential to impact considerably on customer satisfaction levels.

Expansion into this channel was deemed crucial for the long term survival of banks in the world of electronic commerce (Burnham 2003). If banking institutions did not engage in this channel they could lose a large proportion of their customer base. At the onset of the launch of internet banking the operating costs of traditional banks were between 50% and 60% of revenues, while the operating costs of internet banking was estimated to be between 15% and 20% of revenues (Booz-Allen & Hamilton 1997). Initially it was viewed as a low cost alternative to brick and mortar banking as it was much cheaper to create and maintain a web presence. The advent and success of virtual internet banking services illustrates that although banking is essential to a modern economy, physical banks may not be.

According to Peruma (2004) the banking services offered through the medium of the Internet is best categorised as follows:

- Information: the most basic level which delivers marketing information about products and services and serves as an information presentation medium.
- Communication: allows for interaction between the bank's system and the customer, generally limited to electronic mail, enquiries and loan applications.
- Transactional: customers are allowed to execute banking transactions, this level possesses the highest level of risk and must have the strongest controls.

Internet banking has the following capabilities at the transactional level. It allows the individual to check account balances, receive a bank statement, transfer funds between accounts, make bill payments, download account information, communicate with the bank, purchase banking products, order cheque books and deposit books, change ATM pin codes and process stop orders.

According to Weeldreyer (2002) internet banking did not live up to the hype that surrounded it at its inception, customer adoption rates were still low and consumer interest in internet banking was waning. Initially there was the belief that the internet promised a revolution in retail banking. While internet banking has made significant improvements the initial expectations of its potential appeared higher. Banks must make efforts to distinguish between merely getting customers to register for internet banking and getting these customers to become competent and frequent internet banking consumers. Merely getting individuals to register for internet banking does not mean that they will use the service.

The future growth of internet banking depends to a large extent on whether or not consumers accept and use this service. Once these consumer needs are better understood banking services, delivered through this channel, can be optimised.

2.3 Theoretical base for adoption of new technologies

The theoretical basis for the adoption and use of new technologies or innovations has integrated a diverse numbers of sources. The most important of these will be discussed.

The elements of the Theory of Planned Behaviour (TPB) are illustrated in Figure 2. According to this theory, an individual's performance of a specific behaviour is determined by his or her intent to perform that behaviour. Intent is itself informed by attitudes toward the behaviour, subjective norms about engaging in the behaviour, and perceived behavioural controls affecting the individual. In addition, perceived behavioural controls have a direct influence on performing the behaviour. These elements will determine if the individual will be able to successfully engage in the target behaviour according to Azjen and Fishbein (1985).

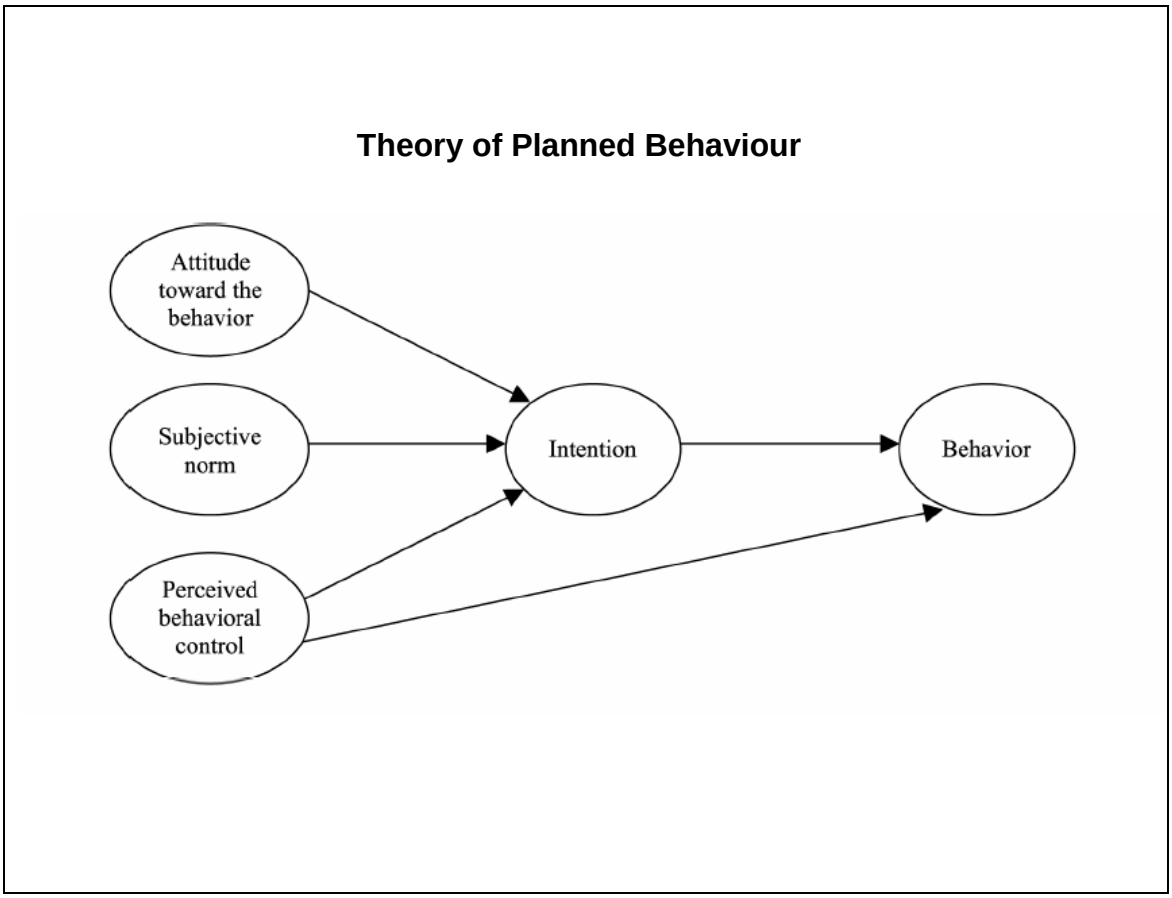


Figure 2. Theory of Planned Behaviour (Ajzen and Fishbein 1985).

Attitudes are informed by personal beliefs, subjective norms are informed by normative social beliefs as well as the motivation placed on an individual to comply, and perceived behavioural control is informed by beliefs about the individual's possession of the abilities and resources needed to engage in the behaviour (Azjen, 1991).

The framework formulated by Azjen and Fishbein (1985) was adapted by Tan and Teo (2000) for the specific use in internet banking. Tan and Teo's (2000) framework consists of a similar multi-dimensional approach to understand the factors that influence consumers who use internet banking. Their framework is depicted in Figure 3. Tan and Teo's (2000) theory of planned behaviour model was found to be the most comprehensive framework describing internet banking

usage and is closely based on constructs from innovation literature. This framework provides a comprehensive way to understand how an individual's attitudes, subjective norms and perceived behavioural control can influence the intention to adopt and use internet banking.

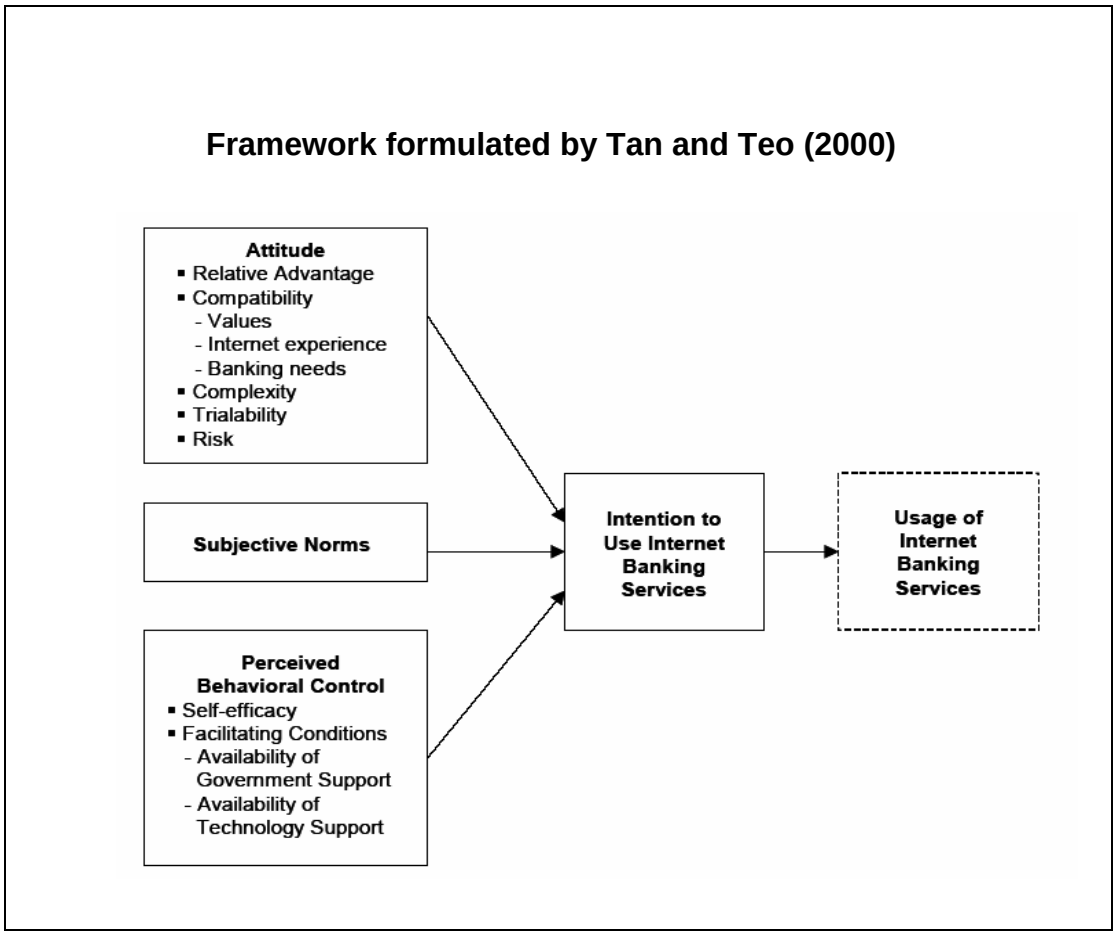


Figure 3. Framework for the Use of Internet Banking (Tan and Teo, 2000).

According to Azjen and Fishbein (1985), an attitude toward behaviour is a positive or negative evaluation of performing that behaviour. Tan and Teo (2000) expanded the attitudinal factors (see upper left box in Figure 3) using constructs from the diffusions of innovation theory (Rogers 1983).

According to the diffusion of innovation theory by Rogers (1983) there are different dimensions to attitudinal belief toward an innovation that could be measured using the five attributes of the innovation:

- Relative advantage: the extent to which the innovation is perceived as superior to all other options.
- Compatibility: the extent to which the innovation is perceived as being in line with personal values, needs and experiences.
- Complexity: the extent to which the innovation is perceived as difficult to understand or use.
- Observability: the extent to which the benefits or attributes of the innovation can be observed, pictured or described.
- Trialability: the extent to which the innovation can be experienced before its actual adoption.

Many authors, including Tan and Teo (2000) and Ndubisi (2006), removed observability as an attribute when adapting it to the internet banking context because privacy was an important component of internet banking.

Subjective norms encompass those social peer influences based on opinions from family, friends and colleagues. Perceived behavioural control covers the controlling influences by the government and those personal and technological controls over an individual's behaviour. The availability of government support listed under perceived behavioural control is irrelevant in South Africa as no such component exists under the current legislation. Personal and technological controls encompass concepts like self-efficacy and technological support structures.

Lichtenstein (2006) also compiled a similar framework of key factors which influences the consumer usage of internet banking and is represented in Figure 4. The factors compiled are attitudinal in nature and do not consider subjective norms. The reason that this framework is mentioned is that it introduces new factors not described by Tan and Teo's (2000) framework.

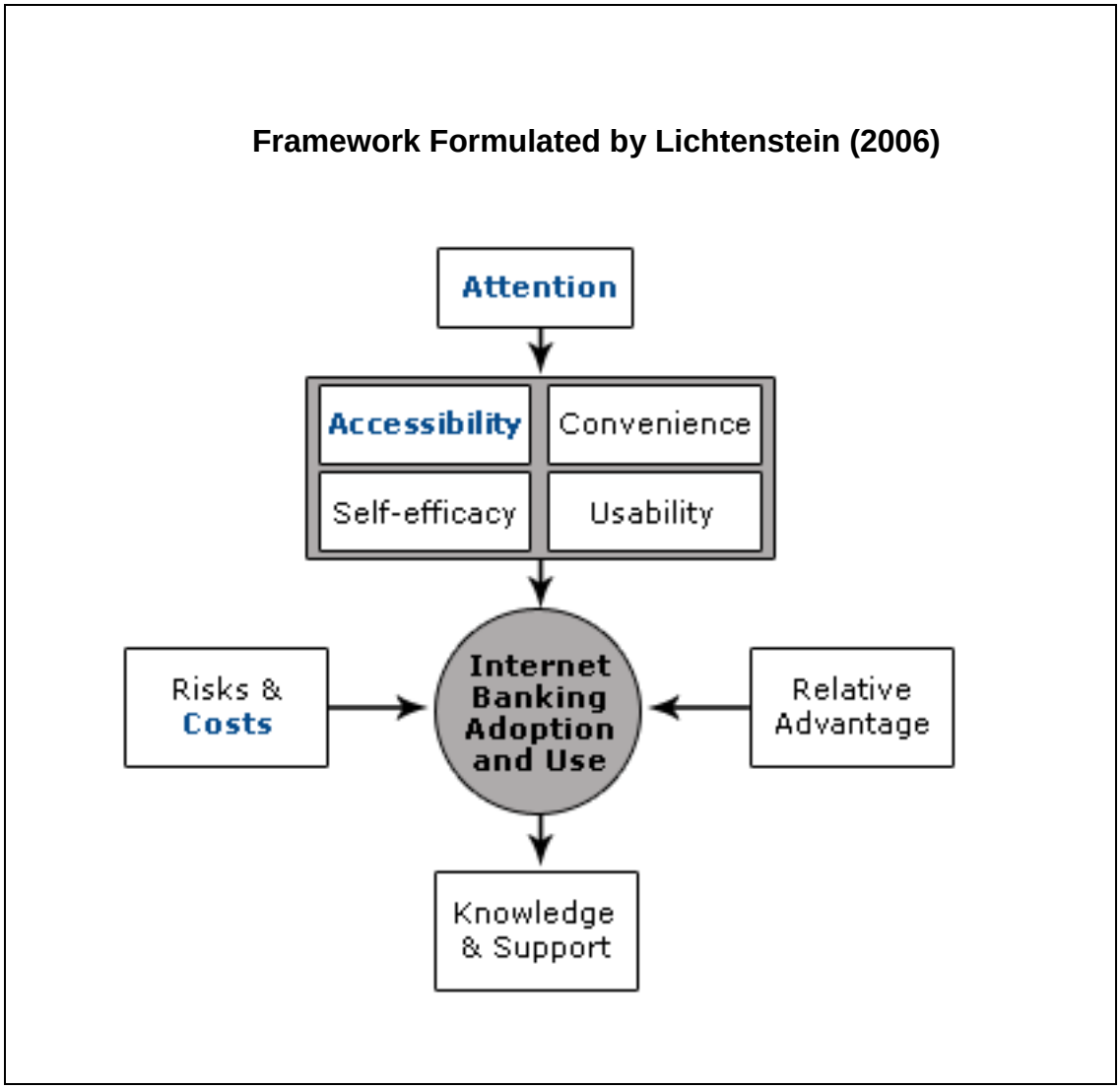


Figure 4. Lichtenstein's Framework showing Key Factors in Consumer Usage of Internet Banking (Lichtenstein 2006).

This framework introduced additional factors which are labelled as attention, accessibility and cost. Attention refers to the awareness that the technology is available and highlights the potential benefits thereof, which in turn influences the attitudinal factors described by Tan and Teo (2000). Other differences in Lichtenstein's (2006) framework were labelling the factor complexity as usability, the inclusion of knowledge and support structures as an attitudinal factor (instead of a behavioural control factor) and adding cost as an element of risk.

The elements in Tan and Teo's (2000) and Lichtenstein's (2006) frameworks will be used to focus the literature review on the factors influencing internet banking. The first study done on factors influencing consumer usage of internet banking in South Africa by Hoppe, Mugera and Newman (2001) was directly based on the framework formulated by Tan and Teo (2000). This study was however done prior to the formulation of Lichtenstein's (2006) framework which uncovered awareness, accessibility and cost as potential factors.

2.4 Factors influencing the use of internet banking

The following factors have been found to be important when examining the frameworks developed by Tan and Teo (2000) and Lichtenstein (2006). They are: Attention and awareness, Relative advantage, Accessibility, Compatibility, Complexity (Usability), Trialability, Self-efficacy, Risk (Trust, Security and Privacy), Cost and Support Structures.

Attention and awareness, accessibility and *cost* were not uncovered as factors by Hoppe, Mugera and Newman (2001) and does not form part of the framework by Tan and Teo (2000) discussed previously. *Attention and awareness* by consumers, accessibility and *cost* does form an integral part of Lichtenstein's (2006) framework.

2.4.1 *Attention and awareness*

Banks must attract the attention of potential and existing customers through better marketing strategies that inform the varied consumer base about the features, advantages and benefits of internet banking. Lichtenstein (2006) confirmed that many internet banking consumers may still be unaware of the relative advantages and benefits of internet banking. This is due to the consumer's attention not being sufficiently drawn to the potential benefits of internet banking. This sentiment was also expressed by Ndubisi (2006) who

emphasised the importance of being able to “jog the mind” of the internet banking consumer by reminding them of the increased value offered through internet banking.

In China, Laforet and Li (2005) showed that non-users of internet banking (which comprised two thirds of their sample) were not at all aware of this service. They concluded that the low level of awareness in China was due to the target market for internet banking being relatively small. Lichtenstein (2006) found that there was a stark lack of awareness of the benefits of internet banking especially by those consumers who had not attempted it. Sarel (2003) also mentioned that most non-users could not recall being approached directly by their banks to apply for internet banking access. Sarel (2003) concluded that a lack of understanding of the concept and its benefits were the main barriers to its adoption and continued use. The poor general understanding of the benefits by these consumers may have led to the decreased use of internet banking even after they have signed up for the service.

Ndubisi (2006) believed that the reason for this was because internet banking was still in its infancy, which makes it challenging for banks to design interventions that would attract the new consumer’s attention and enhance the diffusion of internet banking. Laforet and Li (2005) recommend that banking institutions should consider raising consumer awareness and acceptance of new banking technologies through advertisement and promotions rather than word of mouth communication. Sarel (2003) concurred and found that minimal word of mouth communication was reported by the respondents. Many respondents from the study did not feel the need to share their online banking experience with friends or colleagues.

The manner in which this attention or awareness is obtained is dependent on the type of internet user. Sarel (2003) found that very active users of internet banking tended to be early adopters of any new technology and that many reported trying online banking without requiring any special inducement to try the service. They were willing to use internet banking in response to a simple offer by the bank. This implies that those who are not very active users will need a greater or different incentive to try the service. Sarel (2003) also confirmed

that most consumers who were not very active users registered for online banking only after more aggressive solicitation by their banks. Repeated solicitation to join, as well as incentives such as reduced or waived fees and rewards for enrolment, prompted them to use internet banking. Poor communication efforts by banks contributed to the weak adoption rates and bank marketers needed to identify more effective ways to improve communication efforts to explain the benefits of internet banking.

The inference that can be drawn from the discussion above appears to indicate a positive relationship between the awareness of the benefits of internet banking services and the consumer usage rates of the technology.

2.4.2 *Relative advantage*

According to Tan and Teo (2000) relative advantage can be viewed as the ability to fulfil the internet banking customers' needs relative to the benefits that accrue to the user of the internet banking facility. The constructs that contribute to relative advantage includes facets like improved efficiency in terms of time saving, convenience, safety and the increased availability of choices. Relative advantage was found to be an important factor in determining the adoption and use of new technologies according to Tornatzky and Klein (1982). Furthermore, the perceived relative advantage is positively related to its rate of adoption and use of new technologies (Rogers 1983). Tan and Teo (2000) focussed specifically on internet banking and they confirmed that relative advantage has a significant positive influence on the consumer usage of internet banking. Similar results were found by Sarel (2003), Higa (2005), Ndubisi (2006) and Lichtenstein (2006).

Ndubisi (2006) and Lichtenstein (2006) highlighted some of the facets of relative advantage which include the ability to access your banking accounts from most locations, at anytime, where a computer with an internet connection is available. This advantage allows individuals to manage their personal finances in a more convenient and efficient manner. The experience to potentially conduct

transactions anytime, anywhere and with minimal restriction, was greatly appreciated by consumers and this convenience was viewed as the main benefit.

Sarel (2003) and Higa (2005) found active internet banking users had found the best mix of services, rates and fees to meet their individual needs. The ability to access more service options with less hassle than those offered by brick and mortar banking outlets was regarded as a relative advantage.

Another facet of relative advantage as noted by Lichtenstein (2006) and Laforet and Li (2005) was a higher degree of personal safety by not having to travel to banks and carrying large sums of cash. This was especially highlighted by women with children who had busy lives, house duties and work. They highly valued the convenience of continuous access without having to visit a physical site and carry large cash amounts on their person.

Sarel (2003) also found that decreased use of internet banking services by infrequent users were mainly attributed to lack of need, relative inconvenience and forgetfulness. This group felt that most of the conventional banking inquiries and transactions could be undertaken just as easily through the use of regular banking channels. Some consumers were not particularly impressed with the basic capabilities of internet banking and did not view them as great enhancements to traditional banking channels. These consumers were described as indifferent to the product and showed a reluctance to use it. The poor usage was clearly related to the perceived lack of benefits by these customers. Sarel (2003) goes on to mention that many of these banking customers never bothered to investigate fully whether internet banking would actually be beneficial for them, thereby demonstrating the lack of a perceived relative advantage of the facility.

The facets of relative advantage of internet banking are summarised as follows: the ability to access your bank account anytime of the day from almost anywhere; the ability to access a wider variety of services with the added flexibility of being able to manage more banking needs online; the option to conduct many types of transactions online with fees at a lower rate than that at

physical branches; and the reduced time consumption as well as increased safety from not having to travel to your local branch in order to conduct transactions.

The inference that can be drawn from the discussion above appears to indicate a positive relationship between the relative advantage of internet banking services and the consumer usage rates of the technology.

2.4.3 *Accessibility*

Fast, safe and secure access to the Internet for banking purposes is an important factor that promotes the use of internet banking. Accessibility was not investigated as an influential factor by Tan and Teo (2000) or Hoppe, Mugera and Newman (2001).

Lichtenstein (2006) found that accessibility of the internet, particularly dedicated and unchallenged access at work or at home, contributed positively to the perceptions about the convenience of internet banking. They found that restrictive workplace access negatively affected the intention to adopt and use internet banking and recommended that banks should offer incentives to facilitate internet banking in workplaces. They also recommend that this lack of dedicated unchallenged consumer internet access could be addressed by establishing internet banking kiosks in banks and other safe public areas.

Higa (2005) found that increased internet availability and higher connection speeds were determinant factors of the rapid development of internet banking. Improved connection and download speeds means that less time will be needed to complete internet banking transactions. Sarel (2003) reports that having faster internet connection, at home or at work, made the experience of internet banking much better, and that faster internet connections helped consumers resolve some of the problems they were experiencing.

Not only is fast access regarded as a positive contributing factor to consumer usage of internet banking but so is safe and secure access. Aladwani (2001)

and Rosado *et al*. (2006) discuss the growing trend on increased online fraud through phishing attacks and hacking which are both serious concerns for internet banking consumers. Unsecured internet access is an important factor that contributes to decreased internet banking usage.

The inference that can be drawn from the discussion above appears to indicate a positive relationship between faster and more secure internet accessibility and the consumer usage rates of internet banking.

2.4.4 *Compatibility*

Tornatzky and Klein (1982) found that an innovation was more likely to be adopted when it was compatible with the individual's job responsibilities, lifestyle and value system. This is reinforced by Rogers (1983) who suggested that an innovation is more likely to be adopted if it meets a required need in the consumer's life. Tan and Teo (2000) found similar results to that of Tornatzky and Klein (1982) and Rogers (1983) which showed that the perceived compatibility of internet banking has a positive influence on the use of this innovation. This confirmed that internet users who feel internet banking is compatible with their values are more inclined to use such services.

Hoppe, Mugera and Newman (2001), Ndubisi (2006) and Lichtenstein (2006) all describe compatibility with the individuals' current lifestyle as an important positive determinant of internet banking. These authors describe that most individuals already have established banking norms and a personal finance management system. They had some sort of banking account monitoring process prior to their adoption of internet banking and their acceptance of the internet banking will greatly rely on the extent the new mode accommodates or rejects their past system or values. Compatibility with the consumer's lifestyle and banking practices was found to be a significant factor that contributed to the adoption and continued use of internet banking.

Lichtenstein (2006) indicates that banking consumers who habitually use particular banking methods usually find their own form of banking the most convenient. Lichtenstein (2006) found that telephone bankers believed their banking needs were met as they already had fast, immediate, convenient access and knew how to use telephone banking which they believed was easy to use. Ndubisi (2006) specifically mentions that inherent in this facet is a tendency for some people to resist any form of change. This notion is extended into habits that are formed around any new activity within their lifestyle. These individuals do not even consider whether internet banking would be compatible with their norms or enhance their banking requirements.

Brown (2004a) found that there were significant perceptions of compatibility with internet banking users when considering the interface medium (the computer) that is being used. The typical internet user is accustomed to using the internet at home or at work for informational, communication and transactional purposes. The use of internet banking is perceived to be more compatible when using a computer as opposed to that of cell phone banking where the interface medium (the cell phone) is viewed more as a communication device. Brown (2004a) thus concludes that performing internet banking on a computer was perceived to be more compatible due to the already existing function of the computer.

The inference that can be drawn from the discussion above appears to indicate a positive relationship between the degree of compatibility of the internet banking services with the individual's lifestyle and the consumer usage rates of the technology.

2.4.5 *Complexity (Usability)*

The complexity of innovations was frequently found to influence consumer behaviour. Chung (2002) defined complexity as the degree to which an innovation is considered relatively difficult to understand and use. Cooper and Zmud (1990) point out that any system or innovation that requires less technical

skills and operational effort will more likely be adopted and used. The more complex the innovation is perceived to be, the less likely it is to be adopted and used by customers. Chung (2002) concluded that complexity negatively affects the attitude to adopt internet banking and customers are less likely to use internet banking if they consider it as complicated to use. Complexity is considered to be the exact opposite of ease of use (usability) which was found to have a positive effect on the adoption and use of internet banking (Lederer 2000).

Similar results were found in various studies of internet banking. Ndubisi (2006) showed that complexity was an important factor in the adoption of internet banking. Lichtenstein (2006) found that some people still do not feel confident about their ability to use the Internet and view internet banking as being too difficult. Tan and Teo (2000) found that the perceived complexity was inversely related to the willingness to adopt and use internet banking. All their findings indicated that the perceived complexity has a negative influence on the intention to use internet banking.

This view was extended not only to include the use of internet banking but also to the registration for the service. Sarel (2003) found that the process of registering for internet banking access was perceived as difficult, tedious and complex especially by those who had not attempted to apply for internet banking access to their accounts. Lichtenstein (2006) also found that some complexity concerns were centred on registering and setting up the system. Chung (2002) concluded that customer's are less likely to sign up for internet banking if they believe that it is too much of a hassle to register. The registration process is an integral part of the overall internet banking experience and perceived difficulties experienced here will influence the extent to which a consumer will use the service.

Usability, defined as the inverse of complexity, refers to whether the user and the system can communicate clearly without any misunderstandings through the interface (Hix and Hartson 1993).Usability is regarded as a critical factor for the success of e-commerce and the focus has shifted from providing usable information to making internet sites user-friendly. Return visits are related to

how easily a consumer can complete his task and this is dependent on how user-friendly the website is. Usability can be measured in terms of effectiveness, efficiency and satisfaction (Barnard 2003). Effectiveness is a measure of how well the user or consumer can complete the task at hand. Efficiency looks at the time and resources expended by the consumer to perform the task. A website can be regarded as efficient if it allows the consumer to complete the task in a reasonable amount of time. The level of satisfaction attained by the user while performing tasks on the website is also an input into usability.

The inference that can be drawn from the discussion above appears to indicate a negative relationship between the perceived complexity of internet banking services and the consumer usage rates of the technology.

2.4.6 *Trialability*

Rogers (1983) and Agarwal and Prasad (1998) stated that customers who are allowed to experiment with new innovations are more likely to adopt it. Tan and Teo (2000) found that potential users who are able to experiment with internet banking will be able to give more meaning to it and feel more comfortable with it and they will be more likely to use the technology. Hoppe, Mugera and Newman (2001), Sarel (2003), Ndubisi (2006) and Lichtenstein (2006) also found that trialability had a positive significant association with the intent to adopt and use internet banking. They concluded that if consumers are allowed to test internet banking, the process will minimise their fears, customers will realise that mistakes while using internet banking can be rectified, and will increase the consumer use of internet banking.

In a study by Lichtenstein (2006) a better understanding of the service was needed, even prior to registration for internet banking, in the form of a demonstration or tutorial, so that prospective users could assess how internet banking worked. Recommendations from the study included having training sessions running continuously at bank branches. Sarel (2003) found that the

ability to try the service on a limited basis without making a firm commitment is often regarded as a major factor that can encourage future use. Banks have offered to start with the basic service and then add bill payments later. In this way the monetary cost of discontinuing the service or simply not using it is minimal.

The adoption and use of technology-enabled services requires an intentional willingness to engage in the use of the technology according to Walker (2002). Willing consumers may be open to perform an internet banking trial while there may be those who are unwilling and forced to use this technology under certain circumstances. Walker and Johnston (2006) assert that the willingness of people to try new things along with the opportunity for trial is associated positively with their use of technology-enabled services like internet banking. The option to have a trial with internet banking beforehand creates a familiarity with the technology that can predispose to the increased use of the service once the customer has signed on for the service. Conversely, poor usage rates by individuals with current internet access may be directly related to the lack of prior trialability of internet banking services before registering for the service.

The inference that can be drawn from the discussion above appears to indicate a positive relationship between the prior trialability of internet banking services and the consumer usage rates of the technology.

2.4.7 *Risk (Security, Trust and Privacy)*

Customers need to be satisfied that the bank has the required security in place to ensure confidentiality of their information as well as the safety of their funds (Cunningham 2002). A major obstacle to internet banking has been the perceived lack of security and privacy over the Internet which has led to many customers viewing internet banking as a high risk undertaking. Tan and Teo (2000) and Hoppe, Mugera and Newman (2001) found that perceived security and privacy risks associated with internet banking is a major impediment to the adoption and use of internet banking. This is reinforced by Astbury (2000),

Stafford (2001), Aladwani (2001) and Laforet and Li (2005) who state that privacy and security are the most important issues that consumers had when dealing with internet banking. These authors describe increasing consumer concerns regarding issues like identity theft, phishing attacks, computer fraud and hacking when reviewing consumer perceptions of internet banking security.

However, there are some conflicting results with regard to the relative importance of security issues as a factor that influences the use of internet banking. Ndubisi (2004) found security concerns to be a weak predictor of the adoption and use of internet banking. This diminished concern for security issues may be due to a national bias observed in Malaysia where Ndubisi (2006) found that lower security concerns were attributed to increased levels of assurance by the banks over the security of their internet banking. Banks in Malaysia increasingly promoted their products as fully secure with new enhanced 128-bit encryption technology. The national bias can be explained by differences in socio-economic conditions, the level of diffusion of internet banking and differing governmental regulatory policies specific to that region (Brown 2004b).

Laforet and Li (2005) state that trust in an online firm may not only be derived from prior familiarity with the firm, but also institutional identification and beliefs about the firm. Mukherjee and Nath (2003) concluded that shared values and communication between customer and banking institution played a significant positive role which had a positive influence on commitment and trust by the customer towards the institution. This would indicate that a large amount of trust in using an institution's systems would be derived from prior interactions with the bank and perceptions of the trustworthiness of their brand image and stated goals.

Lichtenstein (2006) found a clear link between the lack of trust and security issues with regard to the use of internet banking. The study describes that many Australian internet banking consumers have learned to live with a sketchy understanding of security, privacy issues and ongoing doubts regarding trust issues of the internet banking website. Many respondents were however placated by the guarantees given by banks to reduce consumer liability in these

situations. Lichtenstein (2006) concluded that in order for customers to better deal with the fear of fraud and relinquishing control over their bank accounts, banks should provide comprehensive guarantees and educate consumers about the services necessary to deal with these issues.

This lack of trust has led to self-styled personal risk management strategies such as printing hard copies of electronic statements as evidence in the event of loss of integrity. Sarel (2003) found that some respondents did not trust the internet banking program to keep an accurate record of payments and that these customers wrote down each cash transaction after entering the amount online.

Another facet of risk that is a barrier to internet banking is the consumer's disappointment and frustration at violations of consumer privacy. There is a great need for consumers to retain control of all aspects of their personal data collection (Pikkarainen, Karjaluoto and Pahnila 2004). Bestavros (2000) points out, that consumers are reluctant to share personal information for fear that their financial life will become an open book. Chung (2002) advocates that banking websites must have a formal, accessible privacy policy as this gives greater confidence to banking customers when conducting internet banking transactions. Gerrard and Cunningham (2003) uncovered consumer concerns that banks may share customer profiles and other information with other companies in the banking group to try and sell additional products. Perceived fears of divulging personal information and feelings of insecurity have a negative influence on internet banking services use (Howcroft 2002). These studies confirmed that customers are less likely to register for internet banking if they are unsure about the security and privacy policies of the website.

The inference that can be drawn from the discussion above appears to indicate a negative relationship between the perceived security risk, violation of trust and privacy of internet banking services and the consumer usage rates of the technology.

2.4.8 *Cost in relation to benefits*

Thornton and White (2002) claimed that lower fees for internet banking accompanied by improved levels of service (including an error free service) were important factors in encouraging the use of the service. This indicates that the cost of providing the service may detract from the frequency with which internet banking is used. Sarel (2003) found that in the United States of America many respondents complained that the internet banking service fees charged by most banks were too high. Most felt that the service would be much more appealing if it was free.

The customer expectations of future prices, in the case of technology goods, can be a pertinent factor that should be taken into account when pricing an innovation (Moyal 2007). In South Africa, many of the local banks offer internet services at comparable costs. Generally costs range from R19,50 (Standard Bank 2008) to R21,95 (ABSA 2008) per month if listed separately. Costs may be incorporated into the customer's annual banking service charge, in which case a specific cost for the provision of internet banking is not listed.

Sarel (2003) also found that some of their active users in the study were attracted by the lower fees and higher interest rates offered by the new online-only banks. Lowering the cost of internet banking could encourage increased use. Tan and Teo (2000) commented that since the cost of providing internet banking services are lower than brick and mortar branches, banks should transfer the cost savings to customers by decreasing their charges. According to Higa (2005) online services tend to be more profitable than offline services mainly due to reduced transactional costs. The cost at which the service is provided may be a contributing factor to the level of consumer usage of internet banking.

The inference that can be drawn from the discussion above appears to indicate a negative relationship between the higher cost of internet banking services and the consumer usage rates of the technology.

2.4.9 *Self-efficacy*

Self-efficacy is defined as a person's belief about his or her ability and capacity to accomplish a particular task. It describes the belief in individual's effectiveness in performing and completing specific tasks (Businessdictionary.com 2008). In this study internet self-efficacy will refer to the degree with which consumers are comfortable with and competent in using the Internet.

Eastin and Larose (2000) found internet self-efficacy to be positively affected by prior internet experience and positive outcome expectancies, and negatively affected by internet stress and internet self-disparagement during the particular task. Sarel (2003) found that most active users who performed the majority of their non-cash banking transactions online, had a strong involvement with the Internet for many different activities. These individuals were very involved with the Internet and showed a strong preference to conduct as many activities as possible on the Internet. These activities included the use of e-mail, information searches, shopping, entertainment and even socialising online. These individuals viewed using the Internet as changing their lives in a meaningful way and they were constantly looking for new applications and greater internet involvement.

Tan and Teo (2000) found that an individual will be more inclined to adopt and use a service if he or she has had enough experience with its supporting technology. This suggests that prior experience with a product class (the Internet) may lead to greater acceptability of a new product (internet banking). Hoppe, Mugera and Newman (2001), Sarel (2003), Laforet and Li (2005) and Lichtenstein (2006) found that previous experience with computers and new technology had a positive effect on internet banking use.

Sarel (2003) believes that extensive internet use reinforced habitual behaviour as most customers in the active user group of the study were accustomed to the service and found its use beneficial. Once the consumers became involved, learned the system and felt comfortable, the benefits became clearer.

The inference that can be drawn from the discussion above appears to indicate a positive relationship between the consumer's self-efficacy with the Internet and the consumer usage rates of internet banking.

2.4.10 *Support structures*

There is a need for responsive and personalised consumer support combined with adequate access to any information required by the consumer with regard to internet banking. Chung (2002), Sarel (2003), Ndubisi (2006) and Lichtenstein (2006) found that inadequate access to sources of assistance and information required to use the system negatively affects the use of internet banking services. Participants in these studies felt that this information should be made available through immediate forms of interaction with banking personnel through face to face, telephone or online chat as opposed to e-mail, searchable internet-based knowledge repositories, web pages or printed materials. These authors concluded that there is a need for improved levels of consumer support from banks particularly with new technologies like internet banking. With regard to technical automated online support, Ndubisi (2006) showed that easy to read and comprehensive information and instructions on the website were important when considering internet banking usage.

The importance of the availability of human support remains an important issue. Chung (2002) stated that banking customers are less likely to register for internet banking if they believe they are less able to talk to staff in person. In this study most respondents felt that in order to resolve a real issue they had to talk to a human. Higa (2005) also found that a great portion of banking customers still require some minimum form of human interface. Sarel (2003) describes that with more complex service or product problems, most consumers felt better dealing with a live customer service representative. The customers felt they got better treatment dealing with problems in this manner. There was a general feeling that with the customer service representative problems got rectified quicker than with the automated systems in internet banking.

According to Sarel (2003) and Ndubisi (2006) participants in these studies were concerned about the fact that bank branch personnel knew little about internet banking. Personnel in branches did not appear to have sufficient knowledge regarding their internet banking services and this was regarded as a discouraging sign and a poor level of consumer support. The authors advocate the need for the immediate availability of support-orientated information to be provided by knowledgeable bank personnel using interactive channels. With the advent of new software solutions which can easily provide contact records of all consumer activity including those transactions that occurred online, it is imperative that banks provide adequate training in these support areas. This will enable effective support by bank staff to consumers, regardless of the banking channel used. The need for this support is ongoing and is required from the initial stages.

There were also concerns regarding support provided for registration of internet banking. Lichtenstein (2006) discovered that many consumers needed support for the initial registration and set-up procedures for internet banking. This study highlighted the fact that some people perceive the initial set-up procedure as cumbersome, complicated, stressful and requiring significant effort. Sarel (2003) found that several customers complained of the lengthy process of establishing an account and having to enter personal information several times. Most regarded it as a long and tedious process. Consumers believed that the overall use of internet banking would be promoted if difficult initial set-up procedures were streamlined by providing adequate support.

In conclusion, Walker (2002) emphasises that providing the right mixture of technology-enabled support and service provided by humans is extremely important. Improvements regarding this issue would be highly dependent on the presence and personal knowledge of the customer service representative as well as the adequate online automated support.

The inference that can be drawn from the discussion above appears to indicate a positive relationship between the extent of consumer support structures for internet banking services and the consumer usage rates of the technology.

From the literature review the following factors were identified as contributory to the consumer usage rates of internet banking: awareness and attention, relative advantage, accessibility, compatibility, complexity, trialability, risk, cost, self-efficacy and support structures.

Proposition 1 Factors that positively influence the consumer usage of internet banking in South Africa include: increased attention and awareness, relative advantage, accessibility, compatibility, trialablity, self-efficacy and the presence of support structures.

Proposition 2 Factors that negatively influence the consumer usage of internet banking in South Africa include: increased complexity, risk and cost.

Each of the identified factors will be tested by means of principal component analysis and multiple regression analysis. In making this determination this study will identify which factors are promoting (positively influences) and which factors inhibit (negatively influences) the consumer usage of internet banking.

2.5 Subjective norms.

With regard to the subjective factors like social influence from peers to use internet banking, Tan and Teo (2000) showed that the influence of the internet banking consumer's reference groups (family, friends, work colleagues) does not have a significant influence on the adoption and use by potential consumers. This result has been confirmed by: Hoppe, Mugera and Newman (2001), Chung (2002) and Ndubisi (2006). The reason stated for this was the easy access to information about the Internet made potential adopters less reliant on information provided by their reference groups. Tan and Teo (2000)

state that in the early phases of implementation of innovations, reference groups are unlikely to know much about the services anyway. The subjective influence from peers will not form part of this study and will not be tested.

2.6 The first South African study on factors effecting internet banking consumers by Hoppe, Mugera and Newman (2001)

Hoppe, Mugera and Newman (2001) performed a study to identify the factors (attitudinal, social influence and behavioural) that influence the adoption and use of internet banking in South Africa. Their survey was performed through an online questionnaire based on questions by Tan and Teo (2000) used in an identical study performed in Singapore in 2000. The objective of the study was to identify and describe the factors influencing the use of internet banking in South Africa and compare these factors to those found in Singapore. Several discrete factors were already identified by Tan and Teo (2000) in Singapore. Hoppe, Mugera and Newman (2001) confirmed that several attitudinal and behavioural control factors played a significant role in the adoption and use of internet banking in South Africa while subjective normative factors did not.

Hoppe, Mugera and Newman (2001) found that the following attitudinal factors: *relative advantage, compatibility, trialabilty* and *risk* (issues relating to security, trust and privacy) were found to significantly influence the use of internet banking in South Africa while *complexity* did not. Subjective norms were not contributory in South Africa and in Singapore. With regard to the behavioural control factors, *government support* was not a significant factor in South Africa but *self-efficacy* did play a role.

There have been similar studies in Australia (Lichtenstein 2006) and Malaysia (Ndubisi 2006) where additional factors have been found to be influential. Additional factors like gaining the awareness and attention of the customer, accessibility and cost of the service were found to influence consumers of

internet banking in these countries. These factors were not uncovered by Hoppe, Mugera and Newman (2001) in their studies.

The following discussion critiques the study done by Hoppe, Mugera and Newman (2001). The list of questions used by Hoppe, Mugera and Newman (2001) were taken directly from the original questionnaire used in Singapore. Their study merely took the survey questionnaire employed by Tan and Teo (2000) and transplanted it without any changes to the South African context. They simply tested the hypotheses used in Singapore without checking to see if it was relevant in South Africa. In Singapore (Tan and Teo 2000) there are explicit national legislative controls which do influence consumers' perceptions of internet banking. Questions related to these controls were not removed for the South African study. National culture is an important determinant on the internet banking identity of a specific country. The differing internet banking identity in South Africa was explained by differences in socio-economic conditions, the level of diffusion of internet banking and differing governmental regulatory policies between regions (Brown 2004b).

There was a minimal literature review with little formal exploration of the nature of the factors which affect the adoption and use of internet banking in the study by Hoppe, Mugera and Newman (2001). They merely used those discrete factors that were found by Tan and Teo (2000). They did not try to draw any parallels to countries with a similar banking infrastructure to formulate their hypotheses.

There were several technical problems with the study done by Hoppe, Mugera and Newman (2001). These included a small overall sample and some technical problems with their website. The small sample of 102 was inadequate for factor analysis as they did not obtain at least 4 respondents per question posed (70 questions) and their results and conclusions need to be viewed with caution. Due to the online questionnaire being very lengthy (more than 70 questions were posed), many respondents opted out without completing the answering process and their reported response rate was therefore inaccurate.

With the current widespread access of the Internet there is a possibility that a more representative sample could now be obtained and thus better reflect the internet banking population in South Africa as a whole. Hoppe, Mugera and Newman (2001) focused on students and academics at the University of Cape Town which may have reflected the profile of the typical internet user in South Africa at that stage. The demographics of those using the Internet has changed with more people who are less affluent and have less formal and tertiary education now using internet banking. There have been substantial technological advances in the internet and banking landscape in South Africa since the study by Hoppe, Mugera and Newman (2001). This study was done when internet banking was novel in the South African banking context.

Electronic systems are now faster and more widespread than before with greater degrees of familiarity and acceptance by the banking consumer in general. Self-efficacy with internet technologies may be less relevant now. Ndubisi (2004) found security concerns to be a weak predictor of the adoption and use of internet banking as banks are expected to improve their internet security features as this technology advances. Lichtenstein (2006) describes that many consumers have learned to live with a poor understanding of security features of internet banking and rely more on the trust of the banking institution. This may indicate that security concerns have become less prominent.

Proposition 3 The changes in the factor profile of consumer usage of internet banking since the study in South Africa done by Hoppe, Mugera and Newman (2001) include: self-efficacy and security concerns being less prominent while the other factors are expected to be unchanged.

2.7 Conclusion of the literature review

The South African study by Hoppe, Mugera and Newman (2001) and the frameworks formulated by Tan and Teo (2000) and Lichtenstein (2006) focus on the relevant factors pertaining to internet banking. The factors identified by these authors are summarised in Table 4.

Table 4. Summary of Factors influencing Internet Banking

Type of factor	**Variable**	**Hoppe, Mugera and Newman (2001)** **South Africa**	**Tan and Teo (2000)** **Singapore**	**Lichtenstein (2006)** **Australia**
Attitudinal	Attention and awareness	Not tested	Not tested	Moderately positive
	Relative advantage	Strongly positive	Strongly positive	Strongly positive
	Accessibility	Not tested	Not significant	Moderately positive
	Compatibility	Strongly positive	Strongly positive	Strongly positive
	Complexity	Strongly negative	Strongly negative	Moderately negative
	Trialability	Moderately positive	Strongly positive	Strongly positive
	Risk	Moderately negative	Strongly negative	Moderately negative
	Cost	Not tested	Not significant	Moderately positive
Subjective Norms	Social Influence	Not significant	Not significant	Not significant
Perceived Behavioural Control	Self Efficacy	Strongly positive	Moderately positive	Strongly positive
	Support Structures	No result obtained	Moderately negative	Strongly positive

In summary, awareness, relative advantage, accessibility, compatibility, complexity, trialability, risk, cost, self-efficacy and support structures appear to be factors that influence consumer usage of internet banking. The following three propositions will be tested using techniques described in the methodological section:

Proposition 1 Factors that positively influence the consumer usage of internet banking in South Africa include: increased attention and awareness, relative advantage, accessibility, compatibility, trialablity, self-efficacy and the presence of support structures.

Proposition 2 Factors that negatively influence the consumer usage of internet banking in South Africa include: increased complexity, risk and cost.

Proposition 3 The changes in the factor profile of consumer usage of internet banking since the study in South Africa done by Hoppe, Mugera and Newman (2001) include: self-efficacy and security concerns being less prominent while the other factors are expected to be unchanged.

This research will ascertain which factors are promoting (positively influences) and which factors are inhibitory (negatively influences) this particular activity. Once the current factor profile is established it will be compared to the factor profile found by Hoppe, Mugera and Newman (2001). This will give an indication if any changes have occurred in the factors affecting internet banking consumers over this time period.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The objective of the research is to explore the factors that currently influence existing internet banking consumers in South Africa. In this study there are two components that will be considered. The first will attempt to determine which factors currently effect internet banking consumers in South Africa by using a technique called factor analysis. Secondly, the findings of this study will be compared to a similar study on factors influencing the use of internet banking in South Africa by Hoppe, Mugera and Newman (2001).

3.2 Research methodology /paradigm

The study will follow a quantitative methodological approach. Factor analysis will be employed to determine the factors influencing the continued use of internet banking by existing consumers in South Africa. Within the marketing context, factor analysis is generally used to determine product attributes that most influence consumers. A multiple regression technique will be applied. This determination will ascertain which factors will promote or inhibit consumers from using internet banking. These factors will be examined and compared to those found by Hoppe, Mugera and Newman (2001) to determine if any noticeable changes have occurred with regard to the way consumers view internet banking in South Africa.

3.3 Research design

Quantitative data will be collected via an online survey. It will employ a web-based questionnaire to accumulate categorical and numerical data from respondents. The study will target existing internet banking customers in South

Africa. A web-based questionnaire, accessible through the Internet, is the most appropriate medium for data collection as it is a convenient way to contact the relevant respondents. This method is not exclusionary as all internet bank consumers must have access to the Internet. The main disadvantages of the online questionnaire are the inability to control who responds to the survey and the inability to test the authenticity of the respondents' answers.

3.4 Population and sample

3.4.1 Population

The population will consist of all those individuals who currently have internet banking access in South Africa. This population will comprise of people who have used internet banking on a regular basis, as well as those who, despite having internet banking access, rarely use this service.

3.4.2 Sample and sampling method

The Internet is regarded as the most suitable medium through which to perform the data collection for the study as the study targets existing internet banking users. Convenience sampling will be employed as it permits the sampling of an appropriate choice of subjects who in a position to provide the information required.

The target sample should contain any adult who uses internet banking in South Africa. Personalised messages will be sent out via email to different classes at the Wits Business School requesting those who have internet banking access to complete a questionnaire. This message will ask respondents to forward the survey to any individuals, known to them, who make use of internet banking.

Attempts will be made to post a request to participate in the survey, accompanied by a link to the questionnaire on relevant news groups and websites on the Internet. Two websites that will be approached will be Fin 24 and the Bank SETA (see letters in Appendix A). The large banking institutions will not be approached as there are security concerns about posting external links on their internet banking websites. In addition, if only one of the large banking institutions agree, the sample may be biased in such away that their bank's successful attributes or qualities may influence certain factors.

An appropriate sample size must be attained. Factor analysis will be employed. This technique requires at least 4 to 5 times as many respondents in the sample as there are questions in your questionnaire (MacCallum, Widaman, Zhang and Hong 1999). For this survey approximately 160 respondents in the sample would be adequate.

3.5 The research instrument

Prior to launching the website the questionnaire was piloted among a group of three MBA class peers to asses their comprehension of the questions and average completion time. The final questionnaire is shown in Appendix B.

The questionnaire will comprise of three parts. The first part contains questions regarding demographic information. The second part presents questions pertaining to the factors identified in the literature review relating to consumer usage of internet banking. This section will present 36 items and respondents score their responses on a 7 Point Lickert scale ranging from 1 – strongly disagree to 7 – strongly agree. The third part determines the degree to which the respondent regards themselves as an active user of internet banking.

3.6 Procedure for data collection

The questionnaire will be hosted on a website where respondents would access the website and complete the questionnaire. The questionnaire will be hosted on Surveymonkey.com, a website where online questionnaires can be hosted and administered. Responses were to be collected through the website for a period of four weeks or until such time as an adequate number of responses were collected.

Software controls allow only fully completed questionnaires to be accepted.

3.7 Data analysis and interpretation

Factor Analysis and Multiple Regression techniques will be used.

Factor analysis is a technique that is frequently used for data reduction and summarisation. It determines underlying relationships by examining the correlation between variables. These underlying relationships can be used to derive the factors that drive customer behaviour. In the internet banking context, these analytical techniques can identify relevant information that is useful to marketers, strategist, financial officers and operational officers in the internet banking division.

A confirmatory factor analysis is performed for the purpose of confirming a known and previously derived factor structure. An exploratory factor analysis is performed for the purpose of exploring an unknown and possible (hypothesized) factor structure. This study will be regarded as an exploratory factor analysis because, despite similar studies done by Tan and Teo (2000) in Singapore and Hoppe, Mugera and Newman (2001) in South Africa, other factors have been identified by Lichtenstein (2006) that needs to be explored in the South African context.

In practice, exploratory and confirmatory factor analyses are often used jointly. Initial work with a measuring scale might involve exploratory factor analysis, to

discern likely patterns in the interrelationships among the observed variables. Once those measured scales are determined, then confirmatory factor analysis would be used to test the expected relationships (Lawler 2002).

The South African factor profile is not stable over time and may be different to other geographical locations. This study is relevant, considering the rapid growth and change in demographic profile of the internet users in South Africa.

3.7.1 Overview

A broad outline of the steps used in conducting factor analysis:

- formulation of the statements
- determination of the optimal number of factors
- generation of the correlation matrix from the data collected
- interpretation of the factors
- construction of scales or factor scores to use in further analyses

Some of the key steps in the process of factor analysis will be discussed.

3.7.2 Formulation of the statements

In formulating the factor analysis the statements that will be posed to the respondents are based on existing theory and past research. In this case, the statements to be included have been derived from the literature review and will be influenced by the judgement of the researcher.

3.7.3 Determination of the optimal number of factors

The ideal number of factors will be determined by assessment of Eigenvalues, a scree plot and the percentage of variance represented in the data. Eigenvalues will have the most emphasis as it best represent the total variance explained by each factor with the first factors representing the most variance (Malhotra 1996).

3.7.4 Generation of the correlation matrix

Principal component factor analysis is recommended when the primary concern is to determine the minimum number of factors that that will account for the maximum amount of variance in data. Principal component analysis will generate a correlation matrix for all the statements posed to the respondents and will extract the initial factor solution. Each variable is expressed as a linear combination of the underlying factors and in a similar fashion the factors observed can be expressed in a linear combination of the observed variables (Malhotra 1996).

3.7.5 Interpretation of the factors

With regard to improving the interpretation of the factors it is usually necessary to rotate and transform the correlation matrix into one that is simpler to interpret. Varimax rotation is most frequently used, but if there are high correlations between variables then orthogonal rotation may yield better results (Malhotra 1996). Factors are then interpreted and labelled based on the variables (questions on the questionnaire) that have high loadings onto the particular factor. The labelled names should be brief and adequately describe the underlying factor.

Factor analysis derives factor loadings in such a way that the groups of variables that are highly interrelated tend to load on the same factor. Loadings are in the range of -1.0 to 1.0 and the higher the absolute value of a loading, the more closely linked a variable is to a specific factor. In some cases it may be necessary to exclude certain variables from the factor analysis. Various authors have based their exclusion of variables on the value of the factor loadings. Some authors use the cut-off of 0.35 (Lederer and Sethi, 1991), while others use a cut-off of 0.5 (Hair and Anderson 1998). These factor loadings are used to translate each respondent's answers to the posed statements into factor scores. These factor scores can be used in further quantitative analyses.

Multiple regression techniques will then be used. The factor scores will be used as independent variables while the question pertaining to intention to use internet banking will be used as the dependent variable. This will identify the driving and inhibitory factors which are important in respect of internet banking. Once relevant factors pertaining to internet banking customers in South Africa have been determined, the findings will be compared to those obtained by Hoppe, Mugera and Newman (2001).

3.7.6 Comparison of factors found by this study to those found by Hoppe, Mugera and Newman (2001)

When comparing the findings of this study to that of Hoppe, Mugera and Newman (2001), it is not possible to make a direct numerical comparison of the data since different samples were used. It is however possible to determine which factors are statistically significant and directly contribute to the consumer usage of internet banking.

It is also not possible to make a direct numerical comparison of the strength of the factors being compared but a comparison can be made of the relative strengths of the factors. This will give an indication to the qualitative nature of the factor, whether it positively or negatively contributes, and if the factor is

weakly or strongly correlated to the use of internet banking. In this way a qualitative comparison can be made.

3.8 Limitations of the study

The Internet is regarded as the most suitable medium to perform the data collection as the study targets existing internet banking users. This will restrict the study to people with access to the Internet and is not exclusionary as all internet bank customers must already have some access to the internet.

The study tends to be aimed at those who tend to be more knowledgeable about the Internet and tends to focus more on experienced Internet users.

There is an inability to control who responds to the study. Instructions will request only people who have internet bank access in South Africa to answer the online questionnaire. There is no way to restrict the answering of the questionnaire to people only resident in South Africa. It is expected that most of the respondents will be resident in South Africa due to the manner in which the questionnaire is distributed.

The survey would most likely reach more urban dwellers so that the sample would not represent the views of consumers who live in rural areas of the country. In a similar fashion, the sample is likely to be distributed amongst more individuals with tertiary levels of education. The results may contain an inherent bias as people with certain characteristics or backgrounds are more likely to respond.

A truly random sample of our population is difficult to obtain as it is too time consuming and costly to attain the required numbers. For this reason a sampling method based on convenience and quota sampling will be used.

Because of the inherent flaws of the sampling technique used, generalisability of the results may not be possible as there may be a systematic bias in terms of those who respond.

3.9 Validity and reliability

The validity of an instrument is how well it measures what it is supposed to be measuring, while reliability refers to the accuracy and consistency with which the instrument produces results (Leedy and Ormond 2001).

According to Leedy and Ormond (2001) content validity is the extent to which the measurement reflects the main concept being measured. Validity in this study is concerned with whether the research process used, the web-based questionnaire and subsequent results from factor analysis and multiple regression, will truly reflect the underlying factors influencing internet banking consumers in South Africa.

3.9.1 External validity

External validity is concerned with how applicable results are across the area being studied, in this case South African internet banking. The research is not expected to yield findings that are applicable globally. The population to be surveyed has been defined. The sample will not be selected randomly but based on convenience sampling. This sample will most likely be representative of a more urban, affluent and educated subsection of the population.

3.9.2 Internal validity

Internal validity reflects how well the questionnaire allows inferences about the causal relationship between data elements (Leedy and Ormond 2001). In this case it represents how well the web-based questionnaire will accurately allow inferences between the data obtained and the underlying factors being tested.

3.9.3 Reliability

Reliability is defined as the extent to which similar research conducted in the future will yield similar results (Leedy and Ormond 2001).

Since summated scales will be used to measure underlying constructs, it is important to know whether the set of questions would elicit the same responses if recast and re-administered to the same respondents. Variables derived from test instruments are declared to be reliable only when they provide stable and reliable responses over a repeated administration of the test.

Cronbach's Alpha is an index of reliability associated with the variation of the true score of the "underlying construct" where the construct is the hypothetical variable that is being measured (Reynaldo and Santos 1999). Cronbach's Alpha is an index of reliability in factor analysis. This index helps to confirm that the instrument in use will always elicit consistent and reliable responses even if questions were replaced with other similar questions.

The Cronbach’s Alpha coefficients ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from dichotomous (questions with two possible answers) and/or multi-point formatted questionnaires or scales (rating scale: 1 = poor, 5 = excellent). The higher the score, the more reliable the generated scale is. Nunnally (1978) indicates that a Cronbach’s Alpha coefficient above 0.6 is an acceptable reliability coefficient but lower thresholds are sometimes used in the literature.

Reliability tests are especially important when derived variables are intended to be used for subsequent predictive analyses. If the scale shows poor reliability, then individual items within the scale must be re-examined and corrected or completely changed as needed.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 Introduction

The presentation of the results will be in the following order: firstly, the demographic analysis; secondly, the principal component analysis findings; thirdly, the results from the multiple regression analysis; and, fourthly, a table comparing factor structures.

199 responses were collected from the website over the 4 week period. 180 respondents completed the entire survey while 19 respondents opted out before completion. This represents a questionnaire completion rate of 90.45%. A single response was also removed as this respondent answered 6 on the Lickert scale throughout the entire survey. This was regarded as an invalid response. The remaining 179 responses were used for the subsequent analysis.

Anonymity was maintained as the respondents were not asked to disclose any personal information during the survey. The IP addresses of computers used to complete the survey were logged and subsequently blocked to prevent any person from completing the survey more than once.

At the time the survey was active, both FIN24 and Bank Seta websites were unable to accommodate a link to the questionnaire. Correspondence with these organisations indicated that they needed more time to authorise permission for the link to be placed on their websites.

4.2 Demographic profile of respondents

The respondents were asked to complete demographic data according to gender, age, monthly income, level of education attained and the nature of their current employment. The monthly income category had the option where respondents could opt not to answer (prefer not to answer). Demographic

analysis for the 179 valid respondents is shown in Table 5. The demographic details are presented by gender, age, monthly income, highest level of education attained and employment status.

Table 5. Demographic Profile of Respondents

Gender	Count	%Percentage
Male	90	50.28
Female	89	49.72
Age		
Under 24	5	2.79
24 - 29	49	27.37
30 - 39	87	48.60
40 - 49	22	12.29
Above 50	16	8.94
Monthly Income		
Prefer not to answer	17	9.50
Under R10 000	11	6.15
R10 000 - R 20 000	32	17.88
R20 000 - R 30 000	27	15.08
R30 000 - R 40 000	29	16.20
R40 000 - R 50 000	27	15.08
Above R 50 000	36	20.11
Highest Level of Education		
High school	3	1.68
Matriculation	17	9.50
Tertiary Education	27	15.08
Bachelor's degree	65	36.31
Master's degree or higher	58	32.40
Other Qualification	9	5.03
Employment		
Student	6	3.35
Full-time employment	156	87.15
Part-time employment	5	2.79
Self-employed	10	5.59
Unemployed	0	0.00
Retired	2	1.12

The respondents are evenly distributed according to gender with slightly more of the respondents being male (50.28%) and the balance being female (49.72%).

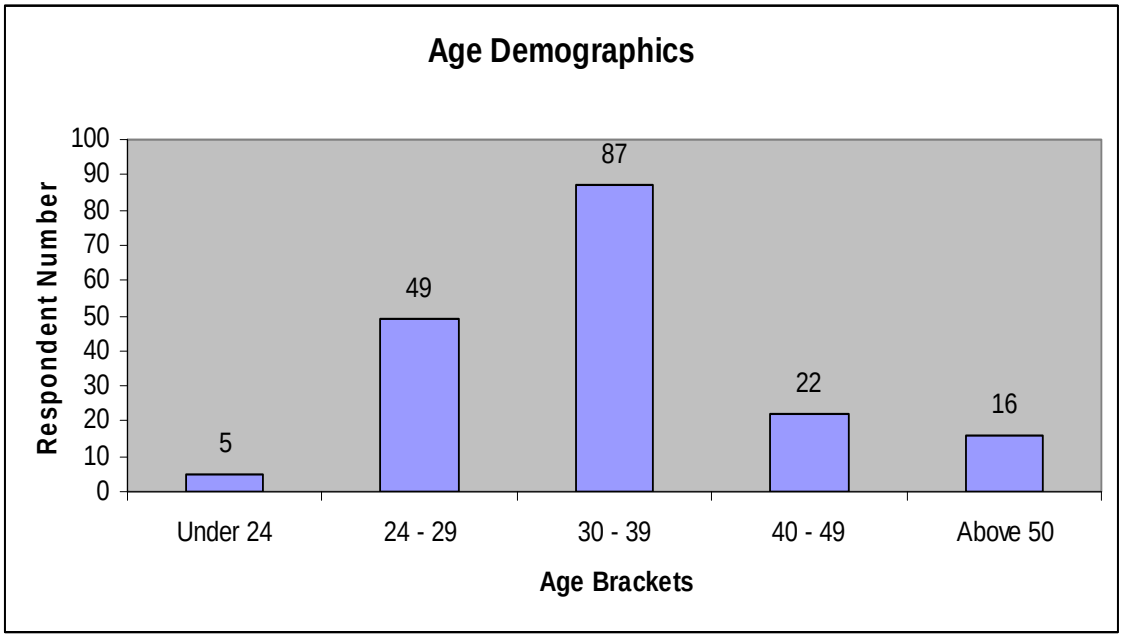


Figure 5. Graphical representation of age demographics

The research was aimed at internet bank account users. Figure 5 indicates that in this sample the majority of respondents were between the ages of 25 and 39 comprising 75.98% of the sample. This reflects that the majority of internet banking consumers are from a slightly younger demographic. This reflects the age range where most people are in full-time employment and are more likely to make use of the added facilities offered by internet banking. Surprisingly there is a good showing of respondents above 50 years old and represents people who adopted this technology at a later stage in life as internet banking facilities have only been present in South Africa for approximately 12 years. This may be due to the nature of their employment, e.g. people employed in fields that provide greater exposure to internet based technology. The small number of respondents under 24 years of age is reflective of the lower demand for internet banking services in this age bracket.

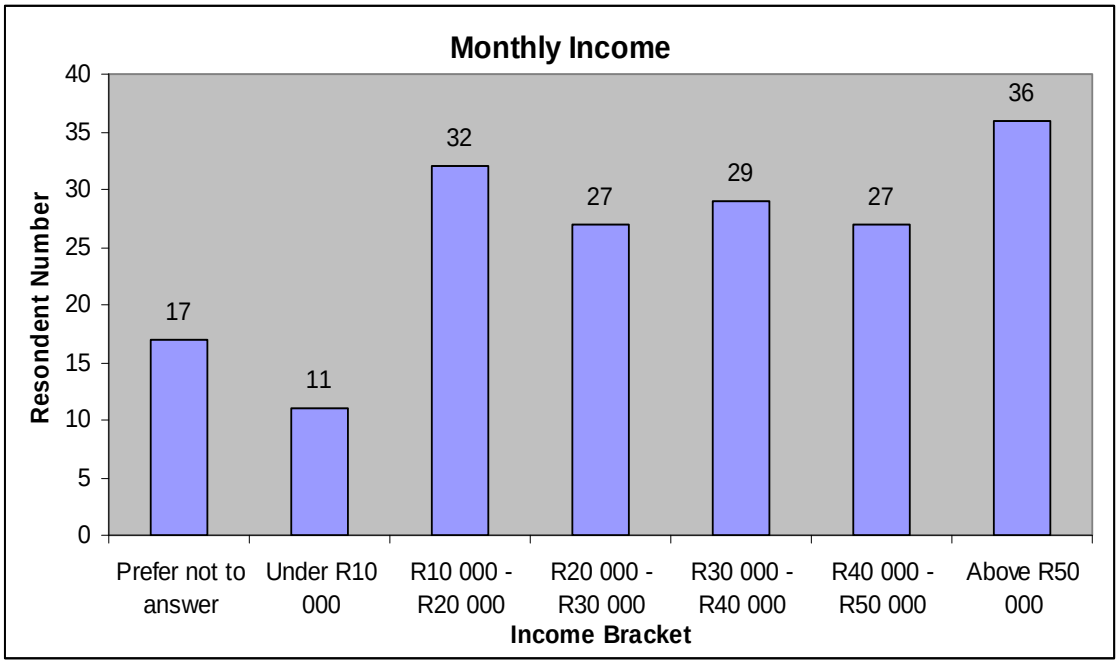


Figure 6. Graphical representation of monthly income demographics

Figure 6 indicates that the monthly income of the majority of respondents (84.35%) is above R10 000 a month which is higher than the average monthly South African salary. The sample shows an even distribution of salaries ranging from R10 000 to above R50 000 a month. The number of respondents who earn less than R10 000 per month comprised only 7.05% of the total sample. This sample is reflective of a more affluent demographic. There were 17 respondents (9.5%) who preferred not to disclose their monthly earnings.

In this sample there is a slightly higher proportion of respondents who earn above R50 000 per month. Individuals with higher earning power are more likely to make use of private banking services but this does not necessarily mean that they would make use of the internet banking facilities to a lesser degree.

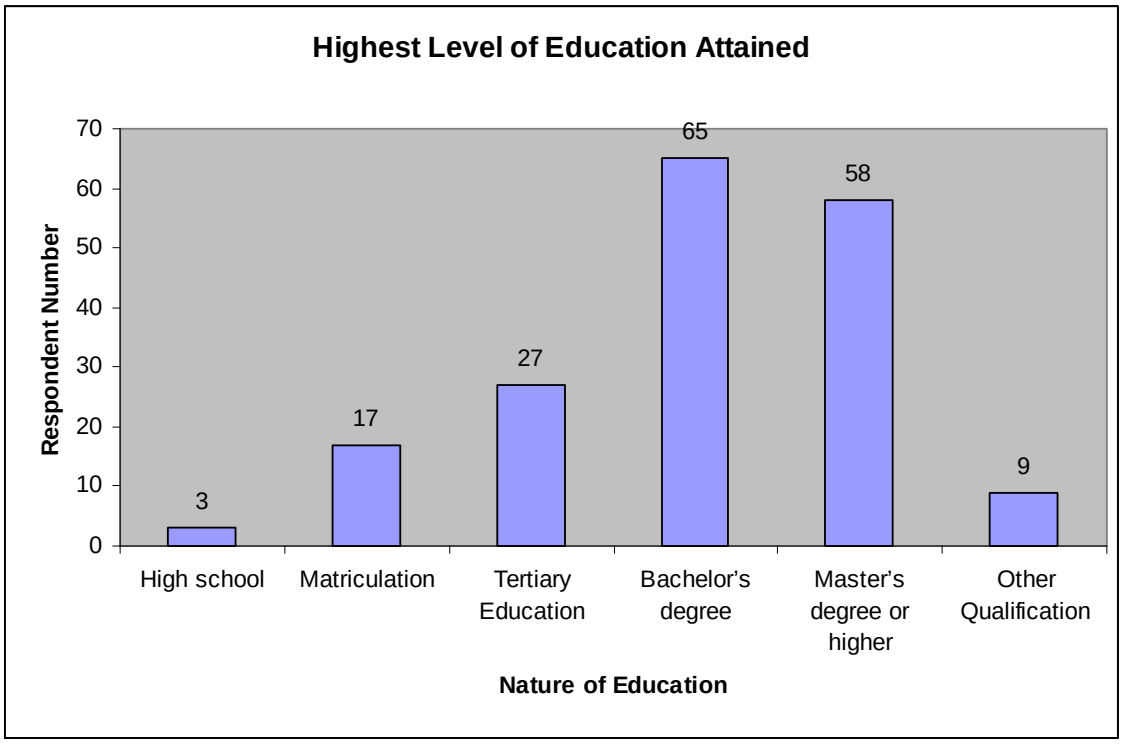


Figure 7. Graphical representation of education demographics

Figure 7 indicates that there are only a small portion of respondents that do not have any exposure to tertiary education. These include respondents whose highest level of education is high school or matriculation and comprises 11.18% of the sample. In this sample, 83.79% of the respondents did have exposure to some form of tertiary education. The remaining 5.03% of the sample had some form of post-matriculation qualification. The sample is more indicative of a highly educated group as the majority of respondents in this group had university degrees.

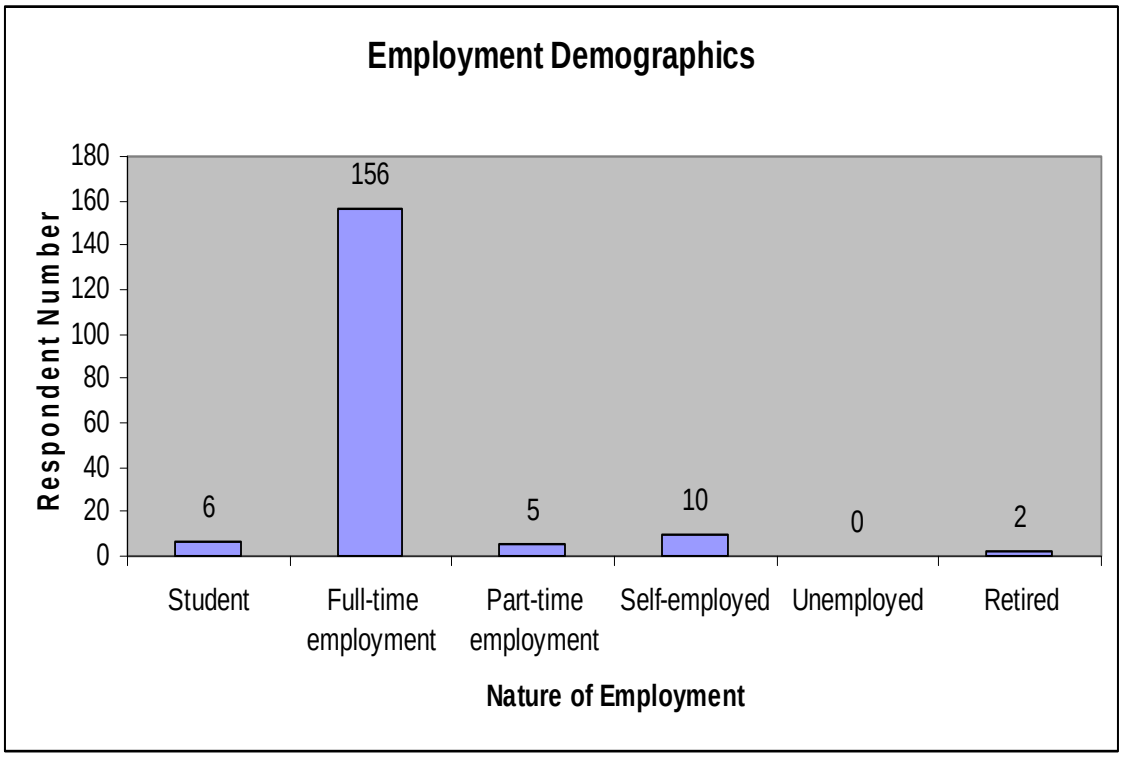


Figure 8. Graphical representation of employment demographics

Figure 8 indicates that the majority of the respondents are in full-time employment representing 87.15% of the sample. There were very few full-time students in the sample when compared to the sample obtained by Hoppe, Mugera and Newman (2001) which had a greater proportion of students. There were no unemployed respondents in the sample.

In general, the demographics discussed above are indicative of a more affluent and educated group with most respondents being in full-time employment. This is in keeping with reports by Higa (2005) and Karjaluoto (2002) who describe the typical internet banking users as highly educated, relatively young and wealthy. This sample also represents a more diverse and larger sample than the sample obtained by Hoppe, Mugera and Newman (2001) where 52% of their respondents were full-time students, 45% of their respondents earned less than the lowest income bracket, reflecting that they were not in full-time employment, and 74% of their respondents were between 20 and 29 years of age.

The demographic questions posed to respondents were deemed to be important to capture the current demographic make up of the typical internet banking user in South Africa.

Figures 9 and 10 show graphical representations of the last two questions of the survey pertaining to how the respondents' perceived their own use of internet banking services.

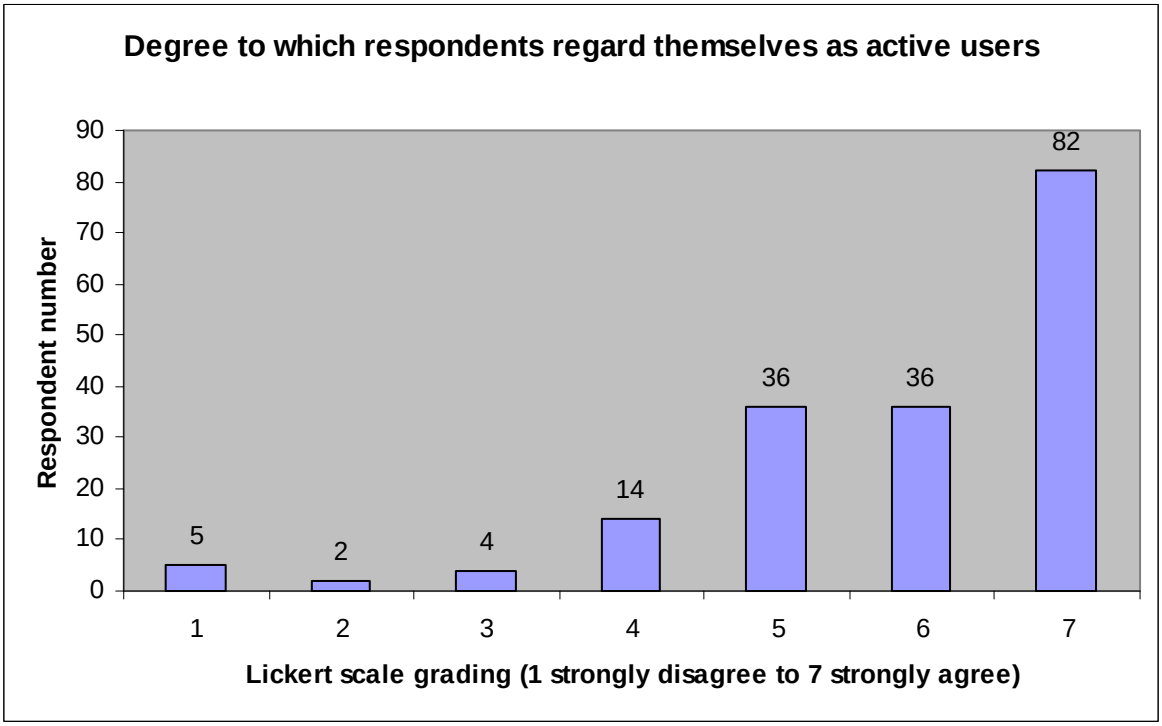


Figure 9. Degree to which respondents regard themselves as active users

Figure 9 indicates that the sample consists mostly of individuals who regarded themselves as active internet banking users with 86.03% of the sample constituting the highest three grades. The lowest three grades constituted only 6.15% of the sample.

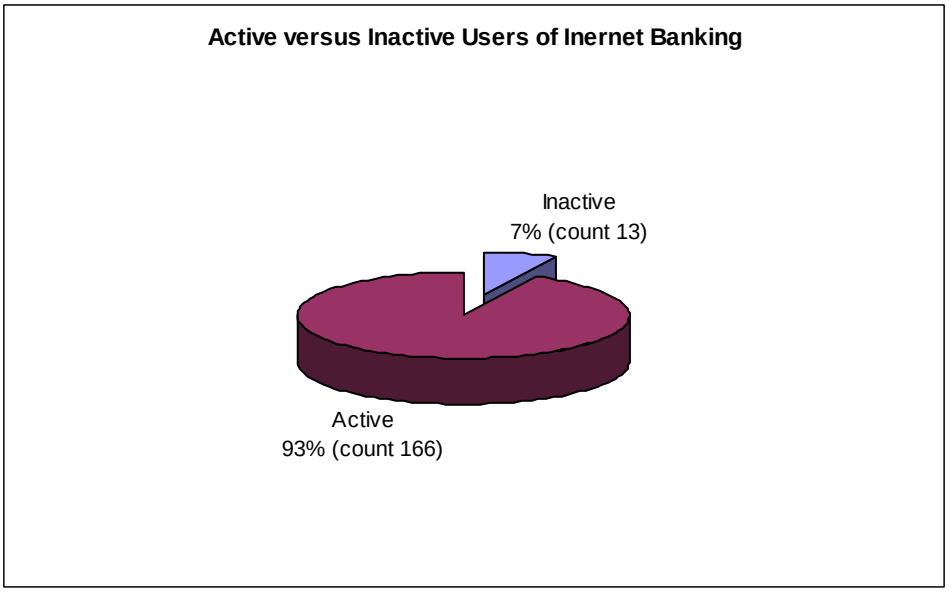


Figure 10. Active versus Inactive Users of Internet Banking

The direct question as to whether respondents regarded themselves as active or inactive uses of internet banking indicated that 7% of the respondents regarded themselves as inactive internet banking users while 93% of the respondents regarded themselves as active internet banking users.

4.3 Results pertaining to the formulation of factors

The principal component analysis results will be presented. To assess construct validity, principal component factor analysis was performed on the data. The 36 items displayed in Table 6 were posed to the respondents and their responses were measured on a 7 point Lickert scale ranging from 1-strongly disagree to 7-strongly agree. Each item is related to a specific factor which was discussed in the literature review and each statement was coded to the specific factor it was intended to confirm. These items were presented to the respondent in a random order (see Appendix B for the complete questionnaire). The item codes relating the statements to a specific factor were not shown in the questionnaire.

Table 6. Items coded to specific factors with corresponding statements.

FACTOR	ITEM	STATEMENT
Awareness	AW1	I find that marketing and awareness campaigns concerning internet banking are effective.
	AW2	An awareness of the benefits of internet banking promotes greater use of internet banking.
	AW3	Banking institutions had made me aware of most of the features of internet banking.
Relative Advantage	RA1	Internet banking allows me to manage my banking more efficiently.
	RA2	Internet banking gives me greater control over bank accounts.
	RA3	Internet banking is an easier and less time consuming way to conduct banking transactions.
	RA4	The benefits of internet banking surpass those provided by physical banks.
Accessibility	ACC1	I have sufficient access to the internet in my daily life at home or at work to do internet banking.
	ACC2	The degree of access to the internet determines the frequency of my internet banking practices.
	ACC3	Greater access to the Internet allows me to become more comfortable performing online banking transactions
	ACC4	It is important that the websites process my transactions promptly.
Compatibility	CMP1	Using internet banking fits in well with the personal management of my day to day life.
	CMP2	Internet banking is compatible with the manner in which I prefer to conduct my finances
	CMP3	Using the internet to conduct banking transactions fits into my working lifestyle.
Complexity	COM1	Using internet banking can be frustrating.
	COM2	Instructions on the internet banking websites are understandable and easy to read.
	COM3	Performing banking transactions on the Internet is difficult.
	COM4	Using internet banking requires a lot of mental effort.
Trialability	T1	I would use internet banking more if I had been allowed to experiment with the service beforehand.
	T2	I would have liked to be able to use internet banking on a trial basis to see what it could do.
	T3	Concerns about internet banking will be minimized if customers have prior exposure to the service
Security, Privacy and Trust	SPT1	I am concerned that information regarding my internet banking transactions will be made known to others
	SPT2	I am concerned that information regarding my internet banking transactions can be tampered with by others
	SPT3	I am confident that advances in internet security technology provides for safer internet banking.
	SPT4	It is important for the internet banking website to have a disclosed privacy and security statement.
	SPT5	I am concerned about risk of financial loss while performing internet banking.
Cost	C1	I consider the cost of internet banking when performing transactions.
	C2	I would be more enthusiastic to use internet banking services if costs were reduced.
	C3	The benefits of using internet banking are well worth the costs involved.
Self-efficacy	SE1	I am very skilled at navigating the internet banking website.
	SE2	I am confident about using unfamiliar websites that I have never been on before.
	SE3	I am capable and know how to find what I want on the internet using a search engine.
Support Structures	SS1	It is important that the website provides for communication with service personnel (via phone, fax or email) if I have a problem.
	SS2	It is important that adequate information is available on the website if I encounter problems while transacting on the banking website.
	SS3	I am confident of using internet banking if I have only the online instructions for reference.
	SS4	There is sufficient support for the registration process for internet banking.

Principal component analysis uncovers whether individual respondents answer statements associated with a specific factor similarly. When similar responses are collated for statements pertaining to a specific factor then a correlation can be determined. These correlations from respondents are used to group items to form distinct factors and to eventually determine the factor structure for the data.

Number Crunching Statistical System (NCSS) © software was used to perform the principal component analysis. This software allows the user to manually configure certain inputs to arrive at the optimal factor structure. The number of factors with an Eigenvalues greater than 1 signifies the optimal number of factors with which to represent the data. In this case the optimal number was 10 as the Eigenvalues for the first ten factors is above 1 (see Appendix C). Based on these Eigenvalues the best factor structure would be obtained when using a ten factor structure.

The cumulative percentage of variance captured in the data by these 10 factors is 67% (see Appendix C). The objective of principal component analysis is to capture the maximum possible variance in the data by using the most appropriate number of factors as identified by the Eigenvalues.

During the analysis using Varimax rotation ten distinct factors were identified. Each item posed to respondents in the questionnaire was required to load onto a single factor with an absolute coefficient of greater than 0.5. This standard was used to confirm factor validity. The individual items were clustered according to the predominant factor that they loaded onto and shown in Table 7.

Table 7. Items and Corresponding Factor Loadings

	Item	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Factor8	Factor9	Factor10
1	CMP1	**-0.8926**	0.0550	0.0751	-0.1250	0.0225	-0.0011	0.0511	-0.0150	0.0560	0.0458
2	RA1	**-0.8234**	0.1043	0.0199	-0.0655	-0.0145	0.0094	-0.0330	-0.0172	0.1388	-0.0123
3	ACC1	**-0.7808**	0.0982	-0.0964	0.0101	0.0039	-0.0461	-0.1358	0.0089	0.0095	0.0934
4	RA2	**-0.7546**	0.1394	0.1180	-0.1423	-0.0079	-0.0304	0.0241	-0.1327	0.0729	-0.1944
5	RA4	**-0.6772**	0.0800	0.0243	-0.1193	0.0453	-0.1040	-0.0293	-0.1894	-0.1192	-0.0634
6	CMP3	**-0.5666**	0.3324	0.0793	-0.5591	0.0245	0.0229	0.0431	-0.1040	0.1792	-0.0694
7	CMP2	**-0.5550**	0.0908	0.1615	-0.5011	0.0548	-0.0647	0.0610	-0.0781	0.1200	-0.0864
8	RA3	**-0.5050**	0.2803	0.0181	-0.5694	0.0086	0.1023	-0.0477	-0.1808	0.2399	-0.1260
9	SPT1	-0.0421	0.0771	**-0.8319**	0.1145	-0.0722	0.1014	-0.0022	0.0442	-0.0625	0.0615
10	SPT2	-0.0064	0.1469	**-0.8116**	0.0028	-0.0297	0.1053	-0.1188	0.1123	-0.0859	-0.1062
11	SPT5	0.1899	0.0758	**-0.7210**	-0.1641	-0.1879	0.2109	0.1081	0.0726	0.0199	0.0189
12	SPT3	0.1369	-0.3090	**-0.6177**	0.1173	-0.0617	-0.1844	0.2218	0.1875	-0.1203	0.0058
13	T1	0.0931	-0.0729	-0.0501	0.0398	0.0559	**0.8221**	-0.0924	0.0661	-0.0192	0.0378
14	T2	0.1085	0.1791	-0.3229	0.0192	-0.1000	**0.6908**	0.1177	0.0829	-0.0899	-0.1108
15	T3	-0.1640	0.4008	0.0064	-0.0287	-0.0660	**0.5161**	-0.0491	-0.0573	-0.1156	-0.2073
16	SE2	0.0358	-0.1383	0.1026	-0.2027	0.0283	-0.0977	**-0.6967**	0.0229	0.1426	-0.0331
17	SE3	-0.2124	0.1096	0.0906	-0.3386	0.1230	0.1115	**-0.5225**	-0.3956	0.0978	-0.1162
18	COM4	0.0562	0.0716	-0.1886	0.0089	0.0339	-0.0189	0.0355	**0.8309**	0.0018	-0.0610
19	COM3	0.3011	0.0360	-0.0827	0.1628	-0.1759	0.1697	-0.1298	**0.6484**	-0.1560	-0.0056
20	C3	-0.2939	0.0170	0.1321	-0.2250	0.2442	0.0538	-0.0803	-0.0547	**0.6749**	-0.0480
21	C2	-0.0908	0.2959	-0.0903	-0.1530	-0.0294	0.3193	0.0511	0.1326	**-0.6538**	-0.1479
22	ACC2	-0.0420	0.1204	-0.1242	-0.0597	-0.0539	0.0300	0.0033	0.0024	-0.0214	**-0.8628**
23	ACC3	-0.1009	0.3147	0.2592	-0.2973	0.1966	0.2228	-0.0446	0.0316	-0.0334	**-0.5132**
24	SS2	-0.2802	**0.8327**	0.0284	-0.0332	-0.0104	0.0569	-0.0251	0.0756	-0.0314	-0.1094
25	SS1	-0.1538	**0.7994**	-0.0816	-0.0258	-0.0495	0.0047	0.0025	0.0639	-0.0970	-0.1180
26	SPT4	-0.1037	**0.6256**	-0.2200	-0.3203	0.1736	0.0994	0.1646	-0.0759	-0.1926	0.0761
27	SS3	-0.0930	-0.1048	0.0192	**-0.6890**	0.0738	-0.0480	-0.2131	0.0207	-0.1146	-0.0563
28	ACC4	-0.3210	0.3973	-0.0959	**-0.5710**	0.0696	-0.0020	-0.1235	-0.1381	0.1509	-0.0944
29	AW3	0.0005	-0.0087	0.0641	-0.0318	**0.8282**	-0.0341	0.1323	0.1541	-0.0651	-0.0011
30	SS4	-0.0995	-0.0005	0.1373	-0.0498	**0.6925**	0.1714	-0.0544	-0.1428	0.3294	0.0691
31	COM2	0.0140	0.1125	0.1499	-0.1094	**0.6965**	-0.1412	-0.1747	-0.3223	-0.0195	-0.1129
32	SE1	-0.3689	0.1198	0.1118	0.1909	0.1618	-0.3249	-0.3680	-0.3711	-0.0555	-0.1683
33	AW2	-0.3825	0.2324	0.1317	-0.0355	0.1979	0.3178	-0.0182	0.1366	-0.2131	-0.3574
34	COM1	0.0013	0.1393	-0.2661	0.0757	-0.2100	0.2276	-0.4945	0.2531	-0.0303	0.2707
35	C1	0.1706	0.0664	-0.0810	0.0159	0.1393	0.4303	0.1845	-0.0585	-0.4696	-0.0126
36	AW1	0.0368	0.4507	-0.0076	0.3184	0.3015	0.2409	-0.0061	0.0135	0.2166	-0.2274

The principal component analysis shows that a total of 31 items out of the original 36 loaded onto ten separate factors. The last 5 items in Table 7 (SE1, AW2, AW1, COM1 and C1) did not load onto any of the ten factors and were not used in further analysis. All the remaining items loaded onto a single factor with an absolute co-effecient of greater than 0.5. A total of 31 items met the criteria for construct validity.

Reliability tests were then performed on the groups of items that constitute each factor (see Appendix C: reliability tests) and are summarised in Table 8. In order to test for reliability, the Cronbach's alpha value is determined for the group of items that load strongly onto each factor.

Table 8. Reliability Tests

Factor Number	Items constituting the factor	Cronbach's Alpha
Factor1	RA1, RA2, RA3, RA4, CMP1, CMP2, CMP3 and ACC1	0.9050
Factor2	SS1, SS2 and SPT4	0.7731
Factor3	SPT1, SPT2, SPT3 and SPT5	0.7807
Factor4	SS3 and ACC4	0.4886
Factor5	AW3, SS4 and COM2	0.6901
Factor6	T1, T2 and T3	0.6665
Factor7	SE1 and SE2	0.4750
Factor8	COM3 and COM4	0.6154
Factor9	C2 and C3	0.0000
Factor10	ACC2 and ACC3	0.5346

The Cronbach's alpha scores range from 0.9050 to 0. The factors with alpha scores below 0.6 (Factors 4, 7, 9, and 10) were deemed not reliable as they were not likely to be reproducible in similar future studies and these factors were removed. The factor constructs with Cronbach's alpha scores above 0.6 (Factors 1, 2, 3, 5, 6 and 8) were deemed reliable and retained. The retained factors will be discussed.

Factor 1 comprises of items from both relative advantage (RA1, RA2, RA3 and RA4) and compatibility with lifestyle (CMP1, CMP2 and CMP3). Item ACC 1 also loaded onto this factor and relates more to issues of compatibility rather than the issue of accessibility. This factor is labelled Relative Advantage and Compatibility.

Factor 2 comprises of items relating to support structures for the website (SS1 and SS2) and the information availability in the form of security and privacy statements (SPT4) of the website. This factor is labelled Support Structures and Website Information.

Factor 3 comprises of items relating to security issues (SPT1, SPT2, SPT3 and SPT5), and is labelled Security Issues.

Factor 5 which comprises items AW3, SS4 and COM2 is representative of a distinct factor with high factor loadings and Cronbach's alpha of 0.6901. These items together convey the idea of efficiency during the introductory experience of internet banking and this factor is labelled Introductory Experiences.

Factor 6 comprises of items relating to trialablity (T1, T2 and T3), and is labelled Trialability.

Factor 8 comprises of items relating to complexity (COM3 and COM4), and is labelled Complexity.

Cost, awareness and accessibility could not be confirmed as discrete factors. These factors were not tested by Hoppe, Mugera and Newman (2001). Self-efficacy was found to be a distinct factor by Hoppe, Mugera and Newman (2001) but was not found to be reliable by this study and could not be confirmed as a factor. Similarly, cost and accessibility, with alpha values of 0.4750 and 0.5346 respectively, were also found to be not reliable. This finding does not exclude the possibility that these constructs are distinct factors but merely reflects that a more reliable tool is required to test if these factors do exist. Attention and awareness could not be identified as a factor as none of the items representing this construct loaded onto a single factor.

The comprehensive factor structure is shown in Table 9. Communality values shown in this table were consistently high for each item. This value represents the strength with which the item contributes to the factor it loads onto.

Table 9. Factor Structure for Consumer Usage of Internet Banking South Africa

Relative Advantage and Compatibility (Factor 1)		**Factor Loadings**	**Communalities**	**Cronbach's Alpha**	**% Variance**
CMP1	Using internet banking fits in well with the personal management of my day to day life.	**-0.8926**	0.8296		
RA1	Internet banking allows me to manage my banking more efficiently.	**-0.8234**	0.7147		
ACC1	I have sufficient access to the Internet in my daily life at home or at work to do internet banking.	**-0.7808**	0.6581		
RA2	Internet banking gives me greater control over bank accounts.	**-0.7546**	0.6854		
RA4	The benefits of internet banking surpass those provided by physical banks.	**-0.6772**	0.5477		
CMP3	Using the internet to conduct banking transactions fits into my working lifestyle.	**-0.5666**	0.8012		
CMP2	Internet banking is compatible with the manner in which I prefer to conduct my finances.	**-0.5550**	0.6323		
RA3	Internet banking is an easier and less time consuming way to conduct banking transactions.	**-0.5050**	0.7772	**0.9050**	13.60
Support Structures and Website Interaction (Factor 2)					
SS2	It is important that adequate information is available on the website if I encounter problems while transacting on the banking website.	**0.8327**	0.7964		
SS1	It is important that the website provides for communication with service personnel (via phone, fax or email) if I have a problem.	**0.7994**	0.6999		
SPT4	It is important for the internet banking website to have a disclosed privacy and security statement.	**0.6256**	0.6689	**0.7731**	8.37
Security Issues (Factor 3)					
SPT1	I am concerned that information regarding my internet banking transactions will be made known to others.	**-0.8319**	0.7381		
SPT2	I am concerned that information regarding my internet banking transactions can be tampered with by others.	**-0.8116**	0.7377		
SPT5	I am concerned about risk of financial loss while performing internet banking.	**-0.7210**	0.6860		
SPT3	I am confident that advances in internet security technology provides for safer internet banking.	**-0.6177**	0.6463	**0.7807**	7.80
Introductory Experiences (Factor 5)					
AW3	Banking institutions made me aware of most of the features of internet banking.	**0.8282**	0.7377		
SS4	There is sufficient support for the registration process for internet banking.	**0.6925**	0.6768		
COM2	Instructions on the internet banking websites are understandable and easy to read.	**0.6965**	0.6998	**0.6901**	5.92
Trialability (Factor 6)					
T1	I would use internet banking more if I had been allowed to experiment with the service beforehand.	**0.8221**	0.7117		
T2	I would have liked to be able to use internet banking on a trial basis to see what it could do.	**0.6908**	0.6768		
T3	Concerns about internet banking will be minimized if customers have prior exposure to the service.	**0.5161**	0.5211	**0.6665**	6.45
Complexity (Factor 8)					
COM4	Using internet banking requires a lot of mental effort.	**0.8309**	0.7408		
COM3	Performing banking transactions on the Internet is difficult.	**0.6484**	0.6467	**0.6154**	5.19

4.4 Results pertaining to determining whether factors are promoting or inhibitory

A multiple regression technique was used on the retained factors, shown in Table 9, which are each considered to be distinct factors. Each respondent's individual factor scores were regressed onto their response in the final question of the questionnaire dealing with the overall intention to use internet banking. This was done in order to ascertain the driving factors and inhibitory factors for internet banking. The results of the multiple regression analysis are shown in Table 10. An alpha significance level of 5% was used.

Table 10. Multiple Regression Analysis

Independent Variable	Regression Coefficient	Beta	Probability Level	Reject H0 at 5%?
Intercept	5.8492	1.000	0.0000	Yes
Relative Advantage and Compatibility	-0.5700	1.000	0.0000	Yes
Support Structures and Website Interaction	0.0771	0.1321	0.4044	No
Security Issues	0.2937	0.8862	0.0017	Yes
Introductory Experiences	0.2088	0.6143	0.0249	Yes
Trialability	0.2963	0.8915	0.0016	Yes
Complexity	-0.1578	0.3982	0.0889	No

The multiple regression analysis was performed to assess which factors promote and which factors inhibit the use of internet banking. The probability level values of less than 0.05 (corresponding to an alpha significance level of 5%) were used to determine if the factor was significant. Probability level values above 0.05 were deemed not significant. Support structures and website interaction and complexity were shown to be distinct factors from the principal component analysis but could not be significantly shown to be either a promoting or an inhibitory factor at an alpha probability level of 5% using the multiple regression technique. At alpha significance levels of 10% (corresponding to a probability level of less than 0.1) the factor complexity is shown to be inhibitory. The beta values, which are indicative of the power of the

test used, helps to confirm those factors that are more likely to be significant. Factors with lower beta values, like complexity and support structures and website interaction, are less likely to be significant. The remaining factors could be assessed as either promoting or inhibitory by individually assessing the sign of the regression co-efficient and the sign on the factor loadings in the principal component analysis. This relates to whether the phrasing used in the statement is positive or negative. Relative advantage and compatibility, trialabilty and introductory experiences are factors shown to have a promoting influence. Concerns about security issues and complexity are shown to have an inhibitory influence on consumer usage of internet banking.

4.5 Results pertaining to the comparison of the factor structure from this study to that of Hoppe, Mugera and Newman (2001)

The results obtained from the multiple regression analysis shown in Table 10 are compared to the results obtained by Hoppe, Mugera and Newman (2001). This comparison is shown below in Table 11.

Table 11. Comparison of Factor Structures

Type of factor	**Variable**	**Hoppe, Mugera and Newman (2001)** **South Africa**	**Current Study (2009)** **South Africa**
Attitudinal	Attention and awareness	Not tested	Not confirmed
	Relative advantage	Strongly positive	Strongly positive
	Accessibility	Not tested	Not confirmed
	Compatibility	Strongly positive	Strongly positive
	Complexity	Strongly negative	Moderately negative
	Trialability	Moderately positive	Strongly positive
	Risk	Moderately negative	Strongly negative
	Cost	Not tested	Not confirmed
Perceived Behavioural Control	Self Efficacy	Strongly positive	Not confirmed
	Support Structures	No result obtained	Not significant
New Factor	Introductory Experiences		Strongly positive

With regard to the relative comparison of factors in this study and those found by Hoppe, Mugera and Newman (2001) most factors are aligned. Attention and awareness, accessibility and cost were not confirmed as factors. Self-efficacy was found to be a significant factor by Hoppe, Mugera and Newman (2001) but was not confirmed in this study.

4.5 Summary of the results

Attention and awareness, accessibility, cost and self-efficacy were not found to be distinct factors that influence the consumer usage of internet banking in South Africa. Relative advantage, compatibility, trialability and positive introductory experiences were shown to be distinct promoting factors while concerns about security issues as well as complexity were shown to be distinct inhibitory factors. Support structures and website information was found to be a distinct factor but could not be significantly confirmed to be either a promoting or an inhibitory factor.

CHAPTER 5: DISCUSSION OF THE RESULTS

5.1 Introduction

The aim of this research report was to ascertain which factors influencing internet banking are relevant in 2009. A distinct factor structure was formulated from the collected data and these factors will be discussed further.

The aim of this study was to obtain a more representative sample than that of Hoppe, Mugera and Newman (2001) and thus a more comprehensive representation of the current internet bank consumer in South Africa.

The sample obtained in this study was larger and more suitable for factor analysis. The sample was more representative of the general population of internet users as compared to that of Hoppe, Mugera and Newman (2001) where a large proportion was unemployed students.

5.2 Demographic profile of respondents

There was no gender bias in the sample with an even split between males and females. The majority of internets banking users were in the age bracket between 25 to 39 years. Howcroft (2002) found that younger consumers value the convenience provided by internet banking more than their older counterparts and valued face-to-face contact with bank service personnel less.

The demographic data for this study is indicative of a more affluent and educated group, with 84.35% earning above R10 000 per month and 83% of respondents having had exposure to tertiary education. The survey was distributed to individuals in the MBA classes at the Wits Business School with a request to circulate the link to family members, peers and work colleagues. This distribution method could have lead to a bias towards more educated and affluent groups. Many modern workplaces have the expectation that individuals

are competent with basic computers skills and are expected to become more conversant with newer forms of technologies as part of their work competencies. A large proportion of respondents (87.5%) in the sample were in full-time employment. This is representative of internet banking users according to Karjaluoto (2002) and Higa (2005) as it is in the workplace where most people have access to the Internet. Nielsen/Netratings (2007) indicates that 64% of internet users have access to the Internet at their workplaces while only 31% have access at home.

According to Nielsen/Netratings (2007) only 25% of the total internet users in South Africa have exposure to some form of tertiary education, with 90% earning more than R50 000 per year.

5.3 Discussion pertaining to promoting factors

The principal component analysis of the collected data yielded six distinct factors. Both validity and reliability tests confirmed these factors.

Relative advantage and compatibility, trialability and introductory experiences were confirmed as promoting factors. Security issues and complexity were confirmed as inhibitory factors. Support structures and website information and self-efficacy could not be confirmed as promoting factors. The three additional factors proposed by Lichtenstein (2006): namely attention and awareness, accessibility and cost could not be confirmed as factors.

5.3.1 Relative advantage and compatibility

The first factor was a composite of two factors discussed in the literature review and was labelled as relative advantage and compatibility. Relative advantage and compatibility made a prominent showing in the multiple regression technique highlighting that this is the cornerstone in the value proposition

offered by internet banking. This was the most prominent factor as it accounted for the greatest variance as represented in the data. Rogers (1983) describes relative advantage as the manner in which an innovation is perceived superior to all other as described by its users and describes compatibility as the extent to which an innovation is perceived as being in line with personal values, needs and experiences. This advantage over alternate banking facilities, coupled with how compatible the technology is with an individual's lifestyle, appears to be the most important promoting factor with regard to internet banking.

5.3.2 Trialability

Trialability was also found to be positive factor with regard to the consumer usage of internet banking in the present study. The items that constitute this factor highlight the importance of prior experimentation and trial of internet banking services, and the potential role this plays in minimising customer anxiety. Triabability was consistently found to be a positively contributing factor by several authors including Tan and Teo (2000), Hoppe, Mugera and Newman (2001), Sarel (2003), Ndubisi (2006) and Lichtenstein (2006). The results confirmed that trialability has a positive significant association with the intent to adopt and use internet banking.

5.3.3 Introductory experiences

The new factor labelled as Introductory Experiences relates to the ease with which individuals are inducted into registering and using the service. The items that constitute this factor emphasise sufficient support for the registration process and that instructions encountered during this process are understandable and easy to read. The registration process is an integral part of the overall internet banking experience and perceived difficulties experienced here will substantially influence the extent to which a consumer will use the

service. Lichtenstein (2006) and Sarel (2003) both highlight the importance of having a hassle free, steam-lined registration process for internet banking.

5.4 Discussion pertaining to inhibitory factors

5.4.1 Security issues

Security issues were confirmed as the most inhibiting factor in the present study. The items constituting this factor express concerns by consumers that their transactions may be tampered with and become known to individuals outside of the banking institution. The risk of financial losses and the concerns about the quality of the security features on the website also contributed prominently to this factor. Security issues have consistently been shown to be an inhibitory factor influencing the consumer usage of internet banking.

As mentioned earlier, Astbury (2000), Aladwani (2001), Stafford (2001) and Laforet and Li (2005) state that security is the most important inhibitory issue that consumers had when dealing with internet banking. This confirms that issues like identity theft, phishing attacks, computer fraud and hacking are still very prominent in the consumer perceptions of internet banking security.

5.4.2 Complexity

Complexity was found to be only moderately inhibitory in the present study as this result only became significant once the alpha significance value was raised to 10%. This is in contrast to the study by Hoppe, Mugera and Newman (2001) which found complexity to be a strong inhibitory factor. The two items that loaded onto this factor in the present study describes performing internet banking transactions as difficult and requiring a great deal of mental effort. Since this factor is less prominent in 2009 it gives an indication that many of the

respondents are more comfortable using internet banking websites and/or that the websites are user-friendly.

5.5 Discussion pertaining to the remaining factor constructs

5.5.1 Support structures and website information

Support structures and website information was found to be a prominent factor in the principal component analysis with high factor loadings and Cronbach's alpha scores. This factor was not found to be a significant promoting factor in the multiple regression analysis. Chung (2002), Sarel (2003) and Ndubisi (2006) made convincing arguments for the importance of adequate online support and interaction with service consultants.

Support structures and website information did not emerge as a promoting factor with regard to internet banking in South Africa. This may reflect that many of the respondents are so accustomed and adept at using internet banking that very minimal need is required for support systems or that user prompts and operating platforms are more than adequate to assist consumers to complete their banking transactions successfully.

5.5.2 Self-efficacy

Self-efficacy did emerge during the principal component analysis but was not deemed to be reliable due to a low Cronbach's alpha score and was excluded as a factor in this study. Sarel (2003) described that extensive internet use reinforces habitual behaviour and that most internet banking customers readily became accustomed to the service and found its use beneficial.

This may reflect that the user interface has become easier to use and that substantial internet knowledge is no longer required to perform rudimentary

internet banking transactions. Another possible interpretation is that internet banking consumers have substantially improved the degree to which they are competent in using the internet so that a significant learning curve for using new applications does not exist.

5.5.3 Attention and awareness

Attention and awareness was not found to be a factor in this study. Sarel (2003), Lichtenstein (2006) and Laforet and Li (2005) made convincing arguments as to the importance of this facet. Ndubisi (2006) proposed that creating awareness of internet banking was an imperative facet in the infancy stages. This factor may not be as prominent in South Africa at present as internet banking may have matured from infancy in tandem with the rapid development and penetration of the Internet in the general population.

5.5.4 Cost

Cost was not found to be a factor. This may be due to the nature in which banks charge for their services. Internet banking fees are included in monthly banking charges. Internet banking charges are said to be free with many bundled banking packages offered to consumers. Many consumers are not confronted with a specific cost for their internet banking and thus cost does not register as an important consideration when performing internet banking.

5.5.5 Accessibility

Accessibility was not found to be a factor. This may be due to the rapid Internet growth and penetration rate in South Africa where at least 1 in 12 individuals have some form of access to the Internet (Goldstuck 2005). Nielsen/Netratings

(2007) also report that 61% of Internet users have sufficient access at work. The time required to perform internet banking is relatively short and not found to be abusive in the context of workplace access.

There is an inherent bias in this result as those with poor access or concerns about accessibility would be less likely to have answered the survey. The degree of penetration into the general population may explain why self-efficacy was a prominent factor in the study by Hoppe, Mugera and Newman (2001) and not the current study.

The degree to which people have become familiar with the Internet may have made self-efficacy redundant. The learning curves for the technology may have been accelerated and more common place with the result that more individuals have taken to the technology faster and the learning curve has becomes less apparent and less of a factor when regarding self-efficacy as a factor.

5.5 Discussion pertaining to the comparison of the factor structure from this study to that of Hoppe, Mugera and Newman (2001)

The comparison of factor structures must be made cautiously as thel study by Hoppe, Mugera and Newman (2001) did not meet the criteria to perform factor analysis as the number of respondents in their survey was small. These results are purely qualitative and a relative comparison can only be made. If there are stark differences, these can be viewed as more indicative of a major shift in that factor.

Referring to Table 11, the most striking difference is that self-efficacy was not found to be significant in this study. Reasons stated for this are that more people are comfortable with internet technology as there is greater exposure in workplaces. People who may well find that they have lower comfort levels with internet technology are less likely to participate in online surveys.

Relative advantage and compatibility was found to be a strong positive factor while concerns about security issues were found to be a strong negative factor with regard to influencing the consumer usage of internet banking in South Africa.

5.6 Conclusion

A distinctive factor structure was derived which describes the factors that influence the consumer usage of internet banking in South Africa.

Relative advantage and compatibility, trialabilty and security issues remain very prominent factors influencing the consumer usage of internet banking in 2009. Support structures and website information along with Lichtenstein's (2006) proposed factors: attention and awareness, accessibility and cost were not found to influence internet banking consumers in South Africa.

Self-efficacy and complexity were found to be less prominent factors in South Africa. This may be indicative of a greater degree of comfort with using internet technologies in the general internet using population in South Africa.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This study confirmed several factors that currently influence the consumer usage of internet banking in South Africa. The results were mostly in keeping with the study performed by Hoppe, Mugera and Newman (2001). The factors that were postulated by Lichtenstein (2006) were also assessed and could not be confirmed as factors.

6.2 Conclusions of the study

The distinct factors that influence the consumer usage of internet banking in South Africa identified by this study include: relative advantage and compatibility; security concerns; trialability of the service; the presence of support structures; and, the degree of complexity experienced while using internet banking. A new factor labelled as introductory experiences emerged during principal component analysis and was found to be contributory to the overall consumer usage of internet banking in South Africa.

Cost, accessibility and awareness which are three factors uncovered by Lichtenstein (2006) could not be confirmed as factors that influence the consumer usage of internet banking in South Africa. Cost and accessibility did emerge in the principal component analysis but were deemed not reliable because of low Cronbach's alpha scores and cannot be confirmed as distinct factors. Awareness did not emerge during the principal component analysis as all three items for this facet did not load onto any of the factors that emerged. It

is unlikely that this is a distinct factor but facets of awareness may be partially contributory to other factors.

Self-efficacy was found to positively contribute to consumer usage of internet banking by Hoppe, Mugera and Newman (2001) but was not confirmed as a factor in this study. Self-efficacy did emerge during the principal component analysis but was not deemed to be reliable due to a low Cronbach's alpha score and was excluded as a factor in this study.

In answer to proposition 1: relative advantage and compatibility; trialability; and, introductory experiences were confirmed as promoting factors. Attention and awareness; accessibility; support structures and website interaction; and self-efficacy could not be confirmed as promoting factors.

In answer to proposition 2: security issues were found to be an inhibitory factor; complexity was found to be an inhibitory factor only if higher alpha levels were used, indicating a lesser prominence when compared to the previous study; and cost could not be confirmed as an inhibitory factor.

In answer to proposition 3: self-efficacy was found not to be a significant contributing factor; security concerns were however found to be as important in this study when compared to the first study; and there were no other substantial divergences of the factor structures from the relative comparisons to the first study.

6.3 Recommendations

The new factor that emerged, labelled as Introductory Experiences, highlights the importance of adequate procedures during the registration process for internet banking. This process needs to be very efficient and free of any problems and should be regarded as a distinct offering in the overall value proposition for internet banking. The introductory experience must be viewed as

an opportunity to create a very positive and lasting impression for consumers which have a direct impact on the continued intention to use internet banking.

Relative advantage and compatibility is the most prominent factor and emphasises the unique value proposition of this service as opposed to brick and mortar banks. Marketers must not overlook the importance of emphasising these features in all interactions with customers, especially those who have not registered for internet banking. Proposed interventions to facilitate this include:

- To make internet banking more mainstream and to create a culture where consumers are as comfortable using internet banking as they are using ATMs. This can be done by providing more internet banking terminals in safe areas like libraries, banks and community centres.

- Increased attempts must be made to get consumers to increase their use of this channel. This can be achieved by allowing banking internet sites to be accessed free of charge by the consumer and having the charges paid by the banking institution.

- Internet banking product development must be in a constant state of innovation to allow for new product offerings via this channel. The product developers should focus on special internet offerings focussing on what consumers most need and utilising the perception of increased relative advantage and convenience.

- Maintaining a form of correspondence with consumers which continually inform them about security feature updates as well as informing them about the guarantees and safeguards offered by banks to counteract financial loss. All consumers using internet banking must be assured that if they have operated within standard procedures and if any interference with their financial transactions occurs, the bank will carry the risk of any financial loss. Banking institutions must take more responsibility for unauthorised transactions which will minimise the concerns felt by consumers when using internet banking.

- To develop programmes whereby consumers in higher age groups can have formal training to increase the comfort level with which they are able to use internet banking services. Elderly consumers will benefit greatly from the added convenience afforded by internet banking to manage their finances. Self-efficacy with internet technologies was not proved to be a factor in this study, but may be important in older age groups.

- With the introduction of internet and cell phone banking there is a greater move towards developing a pure electronic banking model, eliminating the need for cash withdrawals and minimising the need to visit a brick and mortar bank to perform rudimentary transactions. This will allow for increased competitive cost reduction for banking services.

6.4 Suggestions for further research

An area of potential future research could entail the confirmation or exclusion of cost, accessibility and self-efficacy as factors. The research instrument used in this study lacked reliability with regard to these constructs and could be the reason these potential factors were not shown to be significant. This may require the development of more comprehensive scales to measure the presence of these constructs. Cost is unlikely to be a factor due to the reasons already stated. Self-efficacy is proposed to be less important with the proliferation of internet related technologies beyond its introductory or infancy stages. The inherent flaws present in trying to assess accessibility have been mention earlier.

Another area of research could be an in-depth investigation into the registration process of internet banking to identify the key determinants that successfully drive this process. This study confirms that an introductory time period is a distinct factor which should be utilised to create value for the customer and the service provider. This would require further analysis of the registration

structures in place within banking institutions to cater for the registration process.

Further research, involving data gathered in a similar fashion to this study, could be to perform discriminate analysis and cluster analysis once the prevalent factors have been determined. This might help to formulate a practical manner with which to segment the internet banking population in South Africa. This will facilitate the development of more effective campaigns and product offerings to address the needs of each specific group.

Another area of research could be investigating the effects of cell phone banking on the factors which influence internet bank users. Cell phone banking is a relatively new development in the South African banking landscape and is bound to have a profound effect on factors such as accessibility, relative advantage and compatibility associated with internet banking.

REFERENCES

ABSA (2008) *Electronic Banking Pricing Brochure* 2008, last accessed 12/10/2008 from http://www.absa.co.za/absacoza/generated/files/Market%20English%202008.pdf.

Agarwal, R. and Prasad, J. (1998) The antecedents and consequences of user perceptions in information technology adoptions, *Decision Support System*, 22, pp.15-29.

Aladwani, A.M. (2001) Online banking: a field study of drivers, development challenges and expectations, *International Journal of Information Management*, 21 (3), pp. 213-225.

Astbury, K. (2000) The 20 sins of I-banking 2000, *Euromoney*, (379), pp. 72-96.

Azjen, I. and Fishbein, M. (1985) From intentions to actions: a theory of planned behavior, in Kuhl, J. and Beckman, J., *Action-Control: From Cognition to Behavior*, Springer, Heidelberg, pp. 11-39.

Azjen, I. (1991) The theory of planned behavior, organizational behavior and human behaviour, *Decision Processes*, 50, pp. 179-211.

Barnard, L. (2003) Usability issues for E-commerce in South Africa, In *Proceedings of SAICSIT*, Pretoria, pp. 258-267.

Bestavros, A. (2000) Banking industry walks tightrope in personalization of web services, *Bank Systems and Technology*, 37 (1), pp.54-56.

Bonorchis, R. (2008) Clicks introduce cell phone and internet banking, *Business Day*, last accessed 04/07/2008, from http://mybroadband.co.za/news/General/5272.html.

Booz-Allen and Hamilton (1997) Worldwide survey revealed a huge perception gap between Japanese and American/European banks regarding internet banking, last accessed 07/07/1997 from http://www.bah.com/press/jbankstudy.html; current April 22 1997.

Brown, I. (2003) Cell phone banking: predictors of adoption in South Africa—an exploratory study, *International Journal of Information Management*, 23(5), pp. 381-394.

Brown, I. (2004a) Determinants of internet and cell phone banking adoption in South Africa, *Journal of Internet Banking and Commerce*, last accessed 04/07/2008 from http://www.journaldatabase.org/articles/115669/Determinants_of_Internet_.html.

Brown, I. (2004b) The impact of national environment on the adoption of internet banking, *Journal of Global Information Management*, 12(2), pp. 1-26.

Burnham, T. (2003) Consumer switching costs: a typology, antecedents and consequences, *Journal of the Academy of Marketing*, 31(2), pp.109-126.

Businessdictionary.com (2008) *Self-efficacy*, last accessed 20/07/2008 from http://www.businessdictionary.com/definition/self-efficacy.html.

Chung, W. (2002) An evaluation of internet banking in New Zealand, In *Proceedings of the 35th Hawaii International Conference on Systems Sciences*, Hawaii, pp. 1-10.

Cooper, R. and Zmud, R. (1990) Information technology implementation research: a technological diffusion approach, *Management Science*, 36(2), pp. 123-139.

Cunningham, C. (2002) *Generating, Evaluating and Implementing InternetE-commerce Opportunities for Retail Banks in the New Economy*, Unpublished Master's Research Report, University of the Witwatersrand, Johannesburg.

Drucker, P. (1992) The new society of organisations, *Harvard Business Review*, 70 (5), pp. 95-104.

Eastin, M. and Larose, R. (2000) Internet self-efficacy and the psychology of the digital divide, *Journal of Computer Mediated Communication*, 6(1), pp. 114-122.

Fishbein, M. and Ajzen, I. (1975) *Belief, Attitude, Intention and Behaiviour: An Introduction to Theory Research*, Addison-Wesly, Reading.

Freedictionary (2008) *Definition of a Factor*, last accessed on 12/01/2009 from http://www.thefreedictionary.com/factor.

Gerrard, P. and Cunningham, J. (2003) The diffusion of internet banking among Singapore consumers, *International Journal of Bank Marketing*, 21 (1), pp.16-28.

Gibson, J. Ivancevich, J. and Donnelly, J. (2000) *Organisations: Behaviour, Structure, Process*, McGraw Hill, New York.

Goldstuck, A. (2002) The Goldstruck Report: Internet Access in South Africa 2002, *World Wide Worx*, last accessed 16/06/2008 from http://www.theworx.biz/retail02.htm.

Goldstuck, A. (2005) Online Banking in South Africa 2004, *World Wide Worx*, last accessed 16/06/2008 from http://www.theworxbiz/bank04.htm.

Hair, J. and Anderson, R. (1998) *Multivariate Data Analysis*, Fifth Edition, Prentice Hall, Engelwood Cliffs, New Jersey.

Higa, K. (2005) *Strategies towards Internet Banking: Products, Services and User's Behaviour*, Unpublished Master's Thesis, Tokyo Institute of Technology, Tokyo.

Hix, D. and Hartson, H. (1993) *Developing User Interfaces*, John Wiley and Sons Ltd, New York.

Hoppe, R., Mugera, P. and Newman, P. (2001) *Factors Effecting the Adoption of Internet Banking in South Africa: a Comparative Study*, Unpublished Honour's Research Report, University of Cape Town, Cape Town.

Howcroft, B. (2002) Consumer attitude and the usage and adoption of home-based banking in the United Kingdom, *International Journal of Bank Marketing*, 20 (3), pp.111-121.

Hway-Boon, O. and Yu, C. (2003) Electronic commerce; Malaysia; Distribution channels; Commercial banks, *International Journal of Bank Marketing*, 21(6), pp. 369-377.

Karjaluoto, H. (2002) Factors underlying attitude formation towards online banking in Finland, *International Journal of Marketing*, 20(6), pp. 261-267.

Laforet, S. and Li, X. (2005) Consumers' attitudes towards online and mobile banking in China, *International Journal of Bank Marketing*, 23 (5), pp. 362-380.

Laukkanen, P. (2006) *The Effect of Usage Experience on the Banking Barriers of Resistance to Mobile Banking*, Unpublished Master's Thesis, University of Kuopio, Kuopio, Finland.

Lawler, J. (2002) *Factor Analysis*, last accessed 23/03/2008, from http://www.referenceforbusiness.com/encyclopedia/Ent-Fac/Factor-Analysis.html.

Lederer, A. and Sethi, V. (1991) Critical dimensions of strategic information systems planning, *Decision Sciences*, 22, pp 104-119.

Lederer, A. (2000) The technology acceptance model and the world wide web, *Decision Support Systems*, 22, pp. 104-109.

Leedy, P. D. and Ormond, J. E. (2001) *Practical Research: Planning and Design*, Seventh edition, Merril Prentice Hall, Upper Saddle River.

Lichtenstein, S. (2006) Understanding Consumer Adoption of Internet Banking: An Interpretive Study in the Australian Banking Context, *Journal of Electronic Commerce Research*, 7(2) pp. 50-66.

MacCallum, R. Widaman, K. Zhang, S. and Hong, S. (1999) Sample size in factor analysis, *Psychological Methods*, 4, pp. 84-99.

Malhotra, N. (1996) *Marketing Research: An Applied Orientation*, Second Edition, Prentice Hall, Upper Saddle River.

Moody's Investors Service Banking System Outlook Report (2008*) SA Banks looks Good*, last accessed 04/09/2008 from http://www.moodys.com/cust/prodserv/prodserv.aspx?source=StaticContent.xml.

Moyal, L. (2007) *Factors Influencing The Diffusion of Web Technology in South Africa*, Unpublished Master's Research Report, University of the Witwatersrand, Johannesburg.

Mukherjee, A. and Nath, P. (2003) A model of trust in online relationship banking, *International Journal of Bank Marketing*, 21(1), pp. 5-15.

Ndubisi, N. (2006) Consumer attitudes, system's characteristics and internet banking adoption in Malaysia, *Management Research News*, 29(1), pp. 16-27.

Nielsen/Netratings (2002) *Nielsen/NetRatings finds Strong Global Growth in Monthly Internet Sessions and Time Spent Online Between April 2001 and April 2002*, last accessed 16/06/2008 from http://www.nielsen-etratings.com/pr/pr_020610_global.pdf.

Nielsen/Netratings (2007) *Internet Usage in South Africa in 2007*, last accessed 16/06/2008 from http://www.nielsen-netratings.com/intl.jsp?country=za.

Nunnally, I. (1978) *Psychometric Theory*, McGraw-Hill, New York.

Peruma, V. (2004) Internet banking: boon to bane, *Journal of International Banking and Commerce*, 9 (3), pp 102-112.

Pikkarainen, T., Karjaluoto, H. and Pahnila, S. (2004) Consumer acceptance of online banking: an extension of the technology acceptance model, *Internet Research*, 14(3), pp. 224-235.

Pousttchi, K. (2004) Assessment of today's mobile banking applications from the view of customer requirements, In *Proceedings of the 37th Hawaii International Conference on System Sciences*, Hawaii.

Pralahad, C. and Ramaswamy, V. (2000) Co-opting customer competence. *Harvard Business Review*, 78 (1), pp.79-87.

Price Waterhouse Coopers (2001) *Strategic and Emerging Issues in South African Banking*, Price Waterhouse Coopers, Sunninghill.

Reicheld, F. and Schefter, P. (2000) E-loyalty, your secret weapon on the web, *Harvard Business Review*, 78(4), pp. 105-115.

Reynaldo, J. and Santos, A. (1999) Cronbach's Alpha: a tool for assessing the reliability of scales, *Journal of Extension*, 37(2) last accessed 23/03/2008 from http://www.joe.org/joe/1999april/tt3.html.

Rosado, G., Gutiérrez, C. and Piattini, M. (2006) Worldwide web; Security products; Computer applications, *Internet Research*, 16 (5), pp. 519-536.

Rogers, E. (1983), *Diffusions of Innovations*, Free Press, New York.

Sarel, D. (2003) Marketing online banking services: The voice of the customer, *Journal of Financial Services Marketing*, 8(2) pp. 106- 114.

Shahrokhi, M. (2008) E-finance: status, innovations, resources and future challenges, *Managerial Finance*, 34(6), pp. 365-398.

Singh, A. (2004) Trends in South African Internet Banking, In *Aslib Proceedings: New Information Perspectives*, 56(3), pp. 187-196.

Southafricainfo.com (2008) *South Africa's telecommunications*, last accessed on 07/07/2008 from http://www.southafrica.info/business/economy/infrastructure/telecoms.htm.

Stafford, B. (2001) Risk management and I-banking: What every banker needs to know, *Community Banker*, 10(2), pp. 48-49.

Standard Bank of South Africa (2006) *Sustainability and Black Empowerment Report 2006*, last accessed on 07/07/2008 from http:/www.standardbank.co.za/site/investor/sr_2006/i/customer_1.gif.

Standard Bank of South Africa (2008) *Pricing 2008*, last accessed 12/10/2008 from http://www.standardbank.co.za/SB_FILES/Pricing_2008/EPlan.pdf.

Tan, M. and Teo, T. (2000) Factors influencing the Adoption of Internet Banking, *Journal of the Association for Information Systems*, 1(4), pp. 1-39.

Thornton, J. and White, L. (2002) Customer Orientations and Usage of Financial Channels, *Journal of Services Marketing*, 15(3), pp. 201-220.

Tornatsky, I. and Klein, K. (1982) Innovation characteristics and innovation adoption implementation: a meta-analysis of findings, *Transaction of Engineering Management*, 29(1), pp. 28-45.

Walker, R. (2002) An investigation of reasons affecting consumer adoption and rejection of technologically facilitated means of service delivery, In *Proceedings of AZMAC 2000*, Edinburgh, pp.27-42.

Walker, R. and Johnson, L. (2006) Information services; Communication technologies; Virtual banking; Invoicing; Internet shopping. *Journal of Services Marketing*, 20 (2), pp.125-135.

Weeldreyer, C. (2002) Learning from the mistakes of the internet banks, *Cooper Newsletter*, last accessed 04/07/2008 from www.cooper.com/newsletter/2002_07/learning_from internet_banks.htm.

Whitfield, A. (2007) Nedbank Most Costly, *Fin24*, last accessed 04/06/2008 from http://www.fin24.com/articles/default/display_article.aspx?Nav=ns&ArticleID=1518-1786_1815363.

World Wide Worx (2007) *Broadband in South Africa to double up,* last accessed on 16/06/2008 from http://www.worldwideworx.com/archives/38.

APPENDIX A: LETTERS TO FIN 24 AND BANK SETA

Letters sent to Tim Spira (Editor at Fin24) and Kaamini Reddy (Marketing and Communications Manager at Bank Seta) by e-mail.

Title line **Request for assistance with research survey**

I am currently performing some research on internet commerce. The title of the study is *Factors influencing Consumer Usage of Internet Banking in South Africa.* The study aims to determine which factors influence consumers using internet banking in South Africa. The sole purpose is to elicit which factors positively and negatively influence consumers to use internet banking in this country. I would like your assistance in conducting the research by allowing a link to the survey to be posted on your website and encouraging people to complete the questionnaire.

This questionnaire is directed at those people who use internet banking in South Africa. It comprises of less than 50 questions and will only require boxes to be ticked (approximate completion time 6 minutes). The survey will run for a period of four weeks after which time the data will be analysed. The complete questionnaire has been attached.

No personal contact information will be requested and participation in the survey is completely confidential for respondents. No company branding or advertisements will be present on the website.

The survey forms part of a course requirement for a Master's degree at the University of the Witwatersrand Business School. The results from this survey are for purely for academic purposes. All results and analyses from the data obtained will be shared with your institution.

Please let me know if this would be possible at your earliest convenience.

Thank you

Mitchell Le Roux

APPENDIX B: FINAL ONLINE QUESTIONNAIRE

Factors Influencing the Consumer Usage of Internet Banking in South Africa. Exit this survey

1. Introduction

The study aims to determine which factors influence consumers using internet banking in South Africa. The sole purpose of this study is to elicit which factors positively and negatively influence consumers to use internet banking in this country.

The survey forms part of a course requirement for a Master's degree at the University of the Witwatersrand Business School to perform research in a business or commercial domain. The results from this survey are purely for academic purposes.

This questionnaire is directed at those people who use internet banking in South Africa. Respondents are expected to have internet bank accounts.

The survey is quick and easy and only requires tick boxes to be checked.

Part 1 Demographic questions (5 Questions)

Part 2 Factors influencing internet banking (36 Questions)

Part 3 Use of internet banking (2 Questions)

Participation in the survey is confidential and no personal contact information will be requested.

Thank you for your assistance.

Mitchell Le Roux
MBA Student
Univerisity of the Witwatersrand

Next

Factors Influencing the Consumer Usage of Internet Banking in South Africa.

Exit this survey

2. Demographics

*** 1. Gender**

- Male
- Female

*** 2. Age**

- Under 24
- 24 - 29
- 30 - 39
- 40 - 49
- Above 50

*** 3. Monthly Income (Before Taxes)**

- Prefer not to answer
- Under R10 000
- R10 000 - R 20 000
- R20 000 - R 30 000
- R30 000 - R 40 000
- R40 000 - R 50 000
- Above R 50 000

*** 4. Highest Educational Level Attained**

- High school
- Matriculation
- Tertiary Education
- Bachelor's degree
- Master's degree or higher
- Other Qualification

*** 5. Nature of Employment**

- Student
- Full-time employment
- Part-time employment
- Self-employed
- Unemployed
- Retired

Prev Next

Factors Influencing the Consumer Usage of Internet Banking in South Africa. Exit this survey

3. Internet Banking Statements

The following statements are to be scored on a scale ranging from 1 Strongly Disagree to 7 Strongly Agree.

Please provide an answer for each statement.

*** 1. Question 1 to 9**

	1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
1 I find that marketing and awareness campaigns concerning internet banking are effective.							
2 Internet banking allows me to manage my banking more efficiently.							
3 I have sufficient access to the Internet in my daily life at home or at work to do internet banking.							
4 Using internet banking fits in well with the personal management of my day to day life.							
5 Using internet banking can be frustrating.							
6 I would use internet banking more if I had been allowed to experiment with the service beforehand.							
7 I am concerned that information regarding my internet banking transactions will be made known to others.							
8 I consider the cost of internet banking when performing transactions.							
9 I am skilled at navigating the internet banking website.							

Prev Next

Factors Influencing the Consumer Usage of Internet Banking in South Africa.

Exit this survey

4. Internet Banking Statements

*** 1. Questions 10 to 18**

	1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
10 It is important that the website provides for communication with service personnel (via phone, fax or email) if I have a problem.							
11 I am confident about using unfamiliar websites that I have never been on before.							
12 I am concerned that information regarding my internet banking transactions can be tampered with by others.							
13 I would have liked to be able to use internet banking on a trial basis to see what it could do.							
14 The degree of access to the Internet determines the frequency of my internet banking practices.							
15 Internet banking gives me greater control over bank accounts.							
16 Awareness of the benefits of internet banking promotes greater use of internet banking.							
17 It is important that adequate information is available on the website if I encounter problems while transacting on the banking website.							
18 I am confident that advances in internet security technology provides for safer internet banking.							

Prev Next

Factors Influencing the Consumer Usage of Internet Banking in South Africa. Exit this survey

5. Internet Banking Statements

✱ 1. Questions 19 to 27

	1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
19 Instructions on the internet banking websites are understandable and easy to read.	○	○	○	○	○	○	○
20 Greater access to the Internet allows me to become more comfortable performing online banking transactions.	○	○	○	○	○	○	○
21 Internet banking is an easier and less time consuming way to conduct banking transactions.	○	○	○	○	○	○	○
22 I am confident of using internet banking if I have only the online instructions for reference.	○	○	○	○	○	○	○
23 I would be more enthusiastic to use internet banking services if costs were reduced.	○	○	○	○	○	○	○
24 It is important for the internet banking website to have a disclosed privacy and security statement.	○	○	○	○	○	○	○
25 Performing banking transactions on the Internet is difficult.	○	○	○	○	○	○	○
26 Internet banking is compatible with the manner in which I prefer to conduct my finances.	○	○	○	○	○	○	○
27 The benefits of internet banking surpass those provided by physical banks.	○	○	○	○	○	○	○

Prev Next

Factors Influencing the Consumer Usage of Internet Banking in South Africa.

Exit this survey

6. Internet Banking Statements

✱ 1. Question 28 to 36

	1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
28 It is important that the websites process my transactions promptly.	○	○	○	○	○	○	○
29 Using the internet to conduct banking transactions fits into my working lifestyle.	○	○	○	○	○	○	○
30 Using internet banking requires a lot of mental effort.	○	○	○	○	○	○	○
31 Concerns about internet banking will be minimized if customers have prior exposure to the service.	○	○	○	○	○	○	○
32 I am concerned about risk of financial loss while performing internet banking.	○	○	○	○	○	○	○
33 The benefits of using internet banking are well worth the costs involved.	○	○	○	○	○	○	○
34 I am capable and know how to find what I want on the internet using a search engine.	○	○	○	○	○	○	○
35 There is sufficient support for the registration process for internet banking.	○	○	○	○	○	○	○
36 Banking institutions made me aware of most of the features of internet banking.	○	○	○	○	○	○	○

Prev Next

Factors Influencing the Consumer Usage of Internet Banking in South Africa.

Exit this survey

7. Internet Banking Usage

*** 1. Do you currently regard yourself as an active user of internet banking?**

- Yes
- No

*** 2. Activity of Internet Banking Usage**

	1 Inactive	2	3	4	5	6	7 Very Active
How active would you regard yourself as being when it came to performing internet banking							

Prev Done

APPENDIX C: QUANTITATIVE DATA

Eigenvalues after Varimax Rotation
(Used to select the optimal number of factors)

Factor No.	Eigenvalue	Individual Percent	Cumulative Percent	Scree Plot
1	4.895024	13.60	13.60	|||
2	3.012927	8.37	21.97	||
3	2.809126	7.80	29.77	||
4	2.413045	6.70	36.47	||
5	2.132468	5.92	42.40	||
6	2.322377	6.45	48.85	||
7	1.472497	4.09	52.94	|
8	1.869796	5.19	58.13	||
9	1.646139	4.57	62.70	|
10	1.545983	4.29	67.00	|
11	0.941542	2.62	69.61	|
12	0.860570	2.39	72.00	|
13	0.785496	2.18	74.19	|
14	0.748538	2.08	76.27	|
15	0.704550	1.96	78.22	|
16	0.643010	1.79	80.01	|
17	0.592062	1.64	81.65	|
18	0.570464	1.58	83.24	|
19	0.559021	1.55	84.79	|
20	0.531777	1.48	86.27	|
21	0.503257	1.40	87.67	|
22	0.488239	1.36	89.02	|
23	0.457079	1.27	90.29	|
24	0.395553	1.10	91.39	|
25	0.381889	1.06	92.45	|
26	0.359402	1.00	93.45	|
27	0.336177	0.93	94.38	|
28	0.319086	0.89	95.27	|
29	0.310162	0.86	96.13	|
30	0.286243	0.80	96.93	|
31	0.260331	0.72	97.65	|
32	0.220787	0.61	98.26	|
33	0.202991	0.56	98.83	|
34	0.180761	0.50	99.33	|
35	0.149014	0.41	99.74	|
36	0.092619	0.26	100.00	|

Principal Components Report
Page/Date/Time 23 2009/05/30 12:05:39 PM

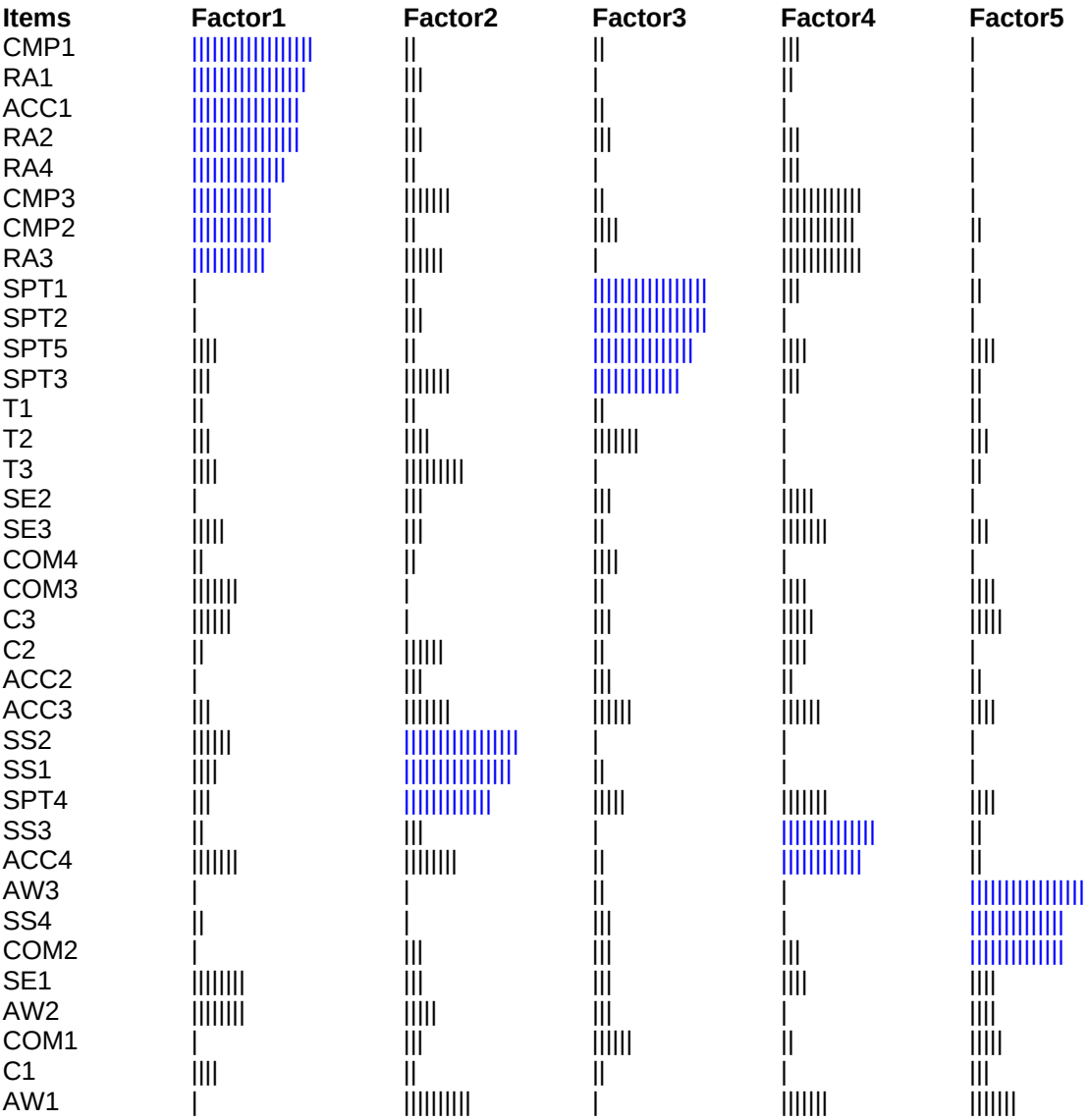
Factor Loadings after Varimax Rotation

Items	Factor1	Factor2	Factor3	Factor4	Factor5
CMP1	-0.892615	0.055024	0.075123	-0.124984	0.022471
RA1	-0.823434	0.104275	0.019880	-0.065472	-0.014530
ACC1	-0.780787	0.098150	-0.096447	0.010149	0.003948
RA2	-0.754645	0.139406	0.118006	-0.142348	-0.007891
RA4	-0.677226	0.080047	0.024306	-0.119313	0.045295
CMP3	-0.566630	0.332420	0.079275	-0.559141	0.024507
CMP2	-0.554967	0.090775	0.161485	-0.501131	0.054804
RA3	-0.505042	0.280303	0.018064	-0.569435	0.008553
SPT1	-0.042115	0.077069	-0.831933	0.114533	-0.072179
SPT2	-0.006412	0.146912	-0.811622	0.002756	-0.029727
SPT5	0.189872	0.075840	-0.720990	-0.164062	-0.187940
SPT3	0.136877	-0.309006	-0.617734	0.117323	-0.061664
T1	0.093063	-0.072895	-0.050141	0.039849	0.055900
T2	0.108499	0.179127	-0.322905	0.019249	-0.100039
T3	-0.163987	0.400765	0.006377	-0.028663	-0.066003
SE2	0.035800	-0.138269	0.102560	-0.202711	0.028308
SE3	-0.212408	0.109626	0.090579	-0.338575	0.123035
COM4	0.056167	0.071580	-0.188575	0.008905	0.033921
COM3	0.301095	0.036021	-0.082688	0.162840	-0.175868
C3	-0.293949	0.016975	0.132098	-0.224992	0.244248
C2	-0.090800	0.295852	-0.090329	-0.153016	-0.029393
ACC2	-0.042028	0.120398	-0.124199	-0.059740	-0.053891
ACC3	-0.100943	0.314706	0.259211	-0.297343	0.196565
SS2	-0.280196	0.832652	0.028409	-0.033189	-0.010411
SS1	-0.153825	0.799407	-0.081634	-0.025807	-0.049456
SPT4	-0.103749	0.625608	-0.219967	-0.320260	0.173629
SS3	-0.093028	-0.104848	0.019192	-0.689017	0.073847
ACC4	-0.321001	0.397263	-0.095910	-0.570970	0.069574
AW3	0.000534	-0.008702	0.064146	-0.031797	0.828151
SS4	-0.099505	-0.000474	0.137307	-0.049787	0.692466
COM2	0.013973	0.112471	0.149930	-0.109409	0.696458
SE1	-0.368933	0.119767	0.111808	0.190854	0.161823
AW2	-0.382501	0.232408	0.131734	-0.035476	0.197910
COM1	0.001267	0.139301	-0.266096	0.075664	-0.209988
C1	0.170575	0.066398	-0.080973	0.015915	0.139304
AW1	0.036790	0.450670	-0.007599	0.318397	0.301510

Factor Loadings after Varimax Rotation

Items	Factor6	Factor7	Factor8	Factor9	Factor10
CMP1	-0.001063	0.051068	-0.015010	0.056018	0.045774
RA1	0.009394	-0.032976	-0.017165	0.138799	-0.012250
ACC1	-0.046061	-0.135756	0.008891	0.009496	0.093408
RA2	-0.030403	0.024052	-0.132738	0.072903	-0.194370
RA4	-0.104010	-0.029344	-0.189435	-0.119210	-0.063382
CMP3	0.022899	0.043148	-0.104025	0.179176	-0.069356
CMP2	-0.064688	0.060966	-0.078125	0.119965	-0.086414
RA3	0.102309	-0.047682	-0.180834	0.239903	-0.126002
SPT1	0.101359	-0.002209	0.044200	-0.062465	0.061466
SPT2	0.105268	-0.118769	0.112330	-0.085872	-0.106201
SPT5	0.210865	0.108127	0.072556	0.019896	0.018862
SPT3	-0.184438	0.221830	0.187546	-0.120314	0.005838
T1	0.822095	-0.092377	0.066113	-0.019247	0.037840
T2	0.690831	0.117696	0.082890	-0.089901	-0.110840
T3	0.516085	-0.049077	-0.057313	-0.115614	-0.207329
SE2	-0.097730	-0.696708	0.022874	0.142582	-0.033077
SE3	0.111521	-0.522498	-0.395601	0.097807	-0.116220
COM4	-0.018924	0.035521	0.830890	0.001824	-0.060988
COM3	0.169670	-0.129841	0.648414	-0.156022	-0.005614
C3	0.053766	-0.080301	-0.054684	0.674948	-0.048042
C2	0.319290	0.051149	0.132614	-0.653769	-0.147895
ACC2	0.030009	0.003275	0.002401	-0.021386	-0.862803
ACC3	0.222811	-0.044623	0.031551	-0.033368	-0.513245
SS2	0.056914	-0.025060	0.075561	-0.031368	-0.109442
SS1	0.004748	0.002454	0.063912	-0.096950	-0.118030
SPT4	0.099414	0.164560	-0.075928	-0.192648	0.076120
SS3	-0.048016	-0.213117	0.020732	-0.114577	-0.056299
ACC4	-0.001982	-0.123451	-0.138101	0.150882	-0.094369
AW3	-0.034117	0.132328	0.154125	-0.065091	-0.001141
SS4	0.171420	-0.054405	-0.142801	0.329401	0.069084
COM2	-0.141175	-0.174683	-0.322262	-0.019532	-0.112909
SE1	-0.324863	-0.367991	-0.371135	-0.055521	-0.168307
AW2	0.317795	-0.018242	0.136644	-0.213069	-0.357437
COM1	0.227561	-0.494468	0.253052	-0.030264	0.270661
C1	0.430340	0.184493	-0.058458	-0.469579	-0.012624
AW1	0.240880	-0.006130	0.013486	0.216585	-0.227431

Bar Chart of Absolute Factor Loadings after Varimax Rotation



Bar Chart of Absolute Factor Loadings after Varimax Rotation

Items	Factor6	Factor7	Factor8	Factor9	Factor10
CMP1					
RA1					
ACC1					
RA2					
RA3					
CMP3					
CMP2					
RA3					
SPT1					
SPT2					
SPT5					
SPT3					
T1					
T2					
T3					
SE2					
SE3					
COM4					
COM3					
C3					
C2					
ACC2					
ACC3					
SS2					
SS1					
SPT4					
SS3					
ACC4					
AW3					
SS4					
COM2					
SE1					
AW2					
COM1					
C1					
AW1					

Reliability Report
Page/Date/Time 1 **2009/05/30 12:31:34 PM**

Reliability Section for Factor 1

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
CMP1	6.312849	1.190978	43.87709	5.967749	0.8770	0.7975
RA1	6.340782	1.137246	43.84916	6.089652	0.8845	0.7213
ACC1	6.430168	1.032824	43.75978	6.271332	0.8939	0.6154
RA2	6.251397	1.059168	43.93855	6.140821	0.8839	0.7331
RA4	5.832402	1.41217	44.35754	6.016418	0.9002	0.5989
CMP3	6.402235	0.9687218	43.78771	6.199825	0.8837	0.7486
CMP2	6.072626	1.240822	44.11732	6.05895	0.8895	0.6729
RA3	6.547486	0.9431788	43.64246	6.27601	0.8891	0.6834
Total		50.18995	6.954726	0.9004		

Cronbach's Alpha 0.900379 **Std. Cronbachs Alpha 0.905323**

Reliability Section for Factor 2

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
SS1	6.178771	1.268192	12.22905	2.374501	0.6064	0.6841
SS2	6.167598	1.392137	12.24022	2.311027	0.6523	0.6353
SPT4	6.061452	1.410881	12.34637	2.433988	0.8028	0.5025
Total		18.40782	3.371418	0.7693		

Cronbach's Alpha 0.769305 **Std. Cronbachs Alpha 0.773123**

Reliability Section for Factor 3

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
SPT1	3.882682	2.020313	10.68715	4.126157	0.6825	0.6816
SPT2	4.234637	1.937427	10.3352	4.23196	0.6954	0.6591
SPT5	3.960894	1.891326	10.60894	4.346395	0.7232	0.6084
SPT3	2.49162	1.395694	12.07821	4.947423	0.8006	0.4378
Total		14.56983	5.698352	0.7847		

Cronbach's Alpha 0.784730 **Std. Cronbachs Alpha 0.780789**

Reliability Section for Factor 4

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
SS3	5.396648	1.570153	6.608939	0.8163556	0.3233	0.1045
ACC4	6.608939	0.8163556	5.396648	1.570153	0.3233	0.1045
Total		12.00559	1.990136	0.4185		

Cronbach's Alpha 0.418530 **Std. Cronbachs Alpha 0.488631**

Reliability Section for Factor 5

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
AW3	4.117319	1.855051	10.21788	2.308391	0.6237	0.4768
SS4	5.100559	1.476768	9.234637	2.603094	0.5457	0.5068
COM2	5.117319	1.219081	9.217877	2.802991	0.5689	0.5137
Total		14.3352	3.585151	0.6705		

Cronbach's Alpha 0.670460 Std. Cronbachs Alpha 0.690097

Reliability Section for Factor 6

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
T1	3.251397	1.898679	8.329609	3.014528	0.5917	0.4693
T2	3.50838	1.912022	8.072626	2.828483	0.4130	0.5925
T3	4.821229	1.656243	6.759777	3.313804	0.6776	0.3954
Total		11.58101	4.250298	0.6693		

Cronbach's Alpha 0.669338 Std. Cronbachs Alpha 0.666539

Reliability Section for Factor 7

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
SE2	4.47486	1.846097	6.217877	1.137963	0.3115	0.0970
SE3	6.217877	1.137963	4.47486	1.846097	0.3115	0.0970
Total		10.69274	2.451897	0.4354		

Cronbach's Alpha 0.435400 Std. Cronbachs Alpha 0.475022

Reliability Section for Factor 8

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
COM4	2.340782	1.3116	1.905028	1.135201	0.4445	0.1975
COM3	1.905028	1.135201	2.340782	1.3116	0.4445	0.1975
Total		4.24581	2.081465	0.6110		

Cronbach's Alpha 0.610973 Std. Cronbachs Alpha 0.615393

Reliability Section for Factor 9

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
C2	5.486033	1.423548	4.977654	2.033305	-0.3184	0.1014
C3	4.977654	2.033305	5.486033	1.423548	-0.3184	0.1014
Total		10.46369	2.077858	-0.8539		

Cronbach's Alpha - 0.853886 **Std. Cronbachs Alpha - 0.934348 (=0)**

Reliability Section for Factor 10

Variable	Mean	Standard Deviation	Total Mean	Total Std.Dev.	Coef Alpha	Corr Total
ACC2	4.614525	2.053227	5.581006	1.335714	0.3648	0.1331
ACC3	5.581006	1.335714	4.614525	2.053227	0.3648	0.1331
Total		10.19553	2.828583	0.5002		

Cronbach's Alpha 0.500196 **Std. Cronbachs Alpha 0.534595**

Multiple Regression Report
Page/Date/Time **1** 2009/05/30 12:18:54 PM

Dependent Variable Intention to use Internet Banking

Run Summary Section

Parameter	Value	Parameter	Value
Dependent Variable	C11	Rows Processed	179
Number Ind. Variables	7	Rows Filtered Out	0
Weight Variable	None	Rows with X's Missing	0
R2	0.2864	Rows with Weight Missing	0
Adj R2	0.2572	Rows with Y Missing	0
Coefficient of Variation	0.2104	Rows Used in Estimation	179
Mean Square Error	1.514508	Sum of Weights	179.000
Square Root of MSE	1.230654	Completion Status	Normal
Ave Abs Pct Error	25.402		

Descriptive Statistics Section

Variable	Count	Mean	Standard Deviation	Minimum	Maximum
Relative Advantage and Compatibility	179	-5.027933E-06	0.9999987	-1.258	6.1026
Support Structures and Website Interaction	179	-2.234637E-06	1.000001	-4.2975	1.8233
Security Issues	179	-2.793296E-06	0.9999993	-2.8704	2.1176
Introductory Experiences	179	5.027933E-06	0.9999974	-2.5871	2.2402
Trialability	179	-5.586592E-07	1.000003	-2.3391	3.1291
Complexity	179	2.234637E-06	0.9999998	-1.994	3.0533
Intention to use Internet banking	179	5.849162	1.427907	1	7

Regression Equation Section

Independent Variable	Regression Coefficient b(i)	Standard Error Sb(i)	T-Value to test H0:B(i)=0	Prob Level	Reject H0 at 5%?	Power of Test at 5%
Intercept	5.8492	0.0920	63.589	0.0000	Yes	1.0000
Relative Advantage and Compatibility	- 0.5700	0.0922	-6.179	0.0000	Yes	1.0000
Support Structures and Website Interaction	0.0771	0.0922	0.836	0.4044	No	0.1321
Security Issues	0.2937	0.0922	3.184	0.0017	Yes	0.8862
Introductory Experiences	0.2088	0.0922	2.263	0.0249	Yes	0.6143
Trialability	0.2963	0.0922	-3.212	0.0016	Yes	0.8915
Complexity	-0.1578	0.0922	-1.711	0.0889	No	0.3982

Estimated Model

5.84915893123766-.569996419477566*(Relative Advantage and Compatibility) + 7.71026481554975E-02*(Support Structures and Website Interaction) + .293736108829862*(Security Issues) + .208751779707317*(Introductory Experiences) +.296316000374687*(Trialability) - .157840458269567*(Complexity)

Multiple Regression Report
Page/Date/Time 2 2009/05/30 12:18:55 PM

Dependent Variable Intention to use Internet Banking

Regression Coefficient Section

Independent Variable	Regression Coefficient	Standard Error	Lower 95% C.L.	Upper 95% C.L.	Standardized Coefficient
Intercept	5.8492	0.0920	5.6676	6.0307	0.0000
Relative Advantage and Compatibility	-0.5700	0.0922	-0.7521	-0.3879	-0.3992
Support Structure and Website Interaction	0.0771	0.0922	-0.1050	0.2592	0.0540
Security Issues	0.2937	0.0922	0.1117	0.4758	0.2057
Introductory Experiences	0.2088	0.0922	0.0267	0.3908	0.1462
Trialability	0.2963	0.0922	0.4784	0.1142	0.2075
Complexity	-0.1578	0.0922	-0.3399	0.0242	-0.1105

Note: The T-Value used to calculate these confidence limits was 1.974.

Analysis of Variance Section

Source	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept	1		6124.073	6124.073			
Model	7	0.2864	103.9464	14.84949	9.805	0.0000	1.0000
Error	171	0.7136	258.9809	1.514508			
Total(Adjusted)	178	1.0000	362.9274	2.038918			

Analysis of Variance Detail Section

Model Term	DF	R2	Sum of Squares	Mean Square	F-Ratio	Prob Level	Power (5%)
Intercept			6124.073	6124.073			
Model	7	0.2864	103.9464	14.84949	9.805	0.0000	1.0000
Relative Advantage and Compatibility	1	0.1593	57.83133	57.83133	38.185	0.0000	1.0000
Support Structures and Website Interaction	1	0.0029	1.058179	1.058179	0.699	0.4044	0.1321
Security Issues	1	0.0423	15.35798	15.35798	10.141	0.0017	0.8862
Introductory Experiences	1	0.0214	7.75672	7.75672	5.122	0.0249	0.6143
Trialability	1	0.0431	15.62905	15.62905	10.320	0.0016	0.8915
Complexity	1	0.0122	4.43462	4.43462	2.928	0.0889	0.3982
Error	171	0.7136	258.9809	1.514508			
Total(Adjusted)	178	1.0000	362.9274	2.038918			

Normality Tests Section

Test Name	Test Value	Prob Level	Reject H0 At Alpha = 20%?
Shapiro Wilk	0.9485	0.000004	Yes
Anderson Darling	2.0464	0.000033	Yes
D'Agostino Skewness	-2.5554	0.010607	Yes
D'Agostino Kurtosis	3.7383	0.000185	Yes
D'Agostino Omnibus	20.5047	0.000035	Yes

APPENDIX D: CONSISTENCY MATRIX

Factors Influencing the Consumer Usage of Internet Banking in South Africa.					
Sub-problem	**Literature Review**	**Propositions**	**Source of data**	**Type of data**	**Analysis**
Determine which factors have a promoting and inhibitory influence on the consumers intention to use internet banking in South Africa	Conceptual frameworks of the Theory of Planned behaviour and The Diffusions of Innovations Theory. Focused review based on Tan and Teo's (2000) and Lichtenstein's (2006) frameworks	Proposition 1: The factors that positively influence the consumer usage of internet banking in South Africa include: increased attention and awareness, relative advantage, accessibility, compatibility, trialablity, self-efficacy and the presence of support structures. Proposition 2: The factors that negatively influence the consumer usage of internet banking in South Africa include: increased complexity, risk and cost.	Online Questionnaire and Factor loadings from principal component analysis	Categorical and numerical ordinal data	Principal Component Factor Analysis and Multiple Regression with Factor Loading as dependent variable and intention to use internet banking as the independent variable using NCSS ©
Comparison of the factor structure found by Hoppe, Mugera and Newman (2001) and this study	Study by Hoppe, Mugera and Newman (2001). South African contextual changes in internet user demographics and banking technology since 2001	Proposition 3: The changes in the factor profile of consumer usage of internet banking since the study in South Africa done by Hoppe, Mugera and Newman (2001) include: self-efficacy and security concerns being less prominent while the other factors are expected to be unchanged.	Results from Hoppe, Mugera and Newman (2001) and current study	Categorical data	Relative Comparison of Factor Structures derived from current study and from Hoppe, Mugera and Newman (2001)