DETERMINANTS OF INTERNET BANKING ADOPTION BY BANKS IN GHANA

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DECLARATION

I, **Edem Bart Williams**, declare that this dissertation is my own work which I have not previously submitted for a degree to any other university. I further declare that all the work I have cited from other authors has been duly acknowledged through academically accepted procedures.

EDEM BART WILLIAMS **DECEMBER 2014**

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EXECUTIVE SUMMARY

Growth in information and communication technology (ICT) is drastically changing the way businesses, especially in the service industries, are conducted. The financial services industry and banking in particular, is not excluded from this technology explosion. Internet banking, even though not new in advanced countries, is a new transaction channel being used by banks in some parts of Africa, especially Ghana, to offer various products and services to their customers. However, this medium has not been fully exploited by these banks as there are many hurdles the banks must triumph over. In deploying this technology and these systems, there are several factors which banks must take into consideration before fully deploying such a system to their customers, hence the motivation for this study.

The absence of suitable and sufficient knowledge on this topic also exposes a "rhetoric versus reality" argument of whether the intention to adopt Internet banking is critical to the strategies and ultimate success of banks in Ghana. For banks to stay ahead of competition as well as to attract and maintain their clientele, it is of paramount importance to gather and link the perspectives of both clients and bank managers in order for banks to ensure that they perform according to the needs and expectations of their clients.

In order to achieve the intended results, an empirical study was conducted by taking into consideration the viewpoints of both bank clients and bank managers in determining the factors that customers take into consideration before adopting the Internet banking medium. The primary aim of this study was to quantify significant relationships between the selected variables. Therefore the positivism research paradigm was used, while the phenomenological paradigm was employed for the measuring instruments. Because multiple sources of data were used, from the perspectives of banking clients and managers in Ghana, methodological triangulation was adopted for this study.

The results of the empirical investigation showed that both groups (clients and managers) considered the variables of market share, technology acceptance, diffusion of innovation, organisational variables, organisational efficiency, and business strategy to have direct influence on the adoption of Internet banking. However, they differed in opinion concerning the degree of influence of these variables. The bank managers' responses leaned more towards strong agreement with the importance of these variables than did those of the bank clients. Thus, for bank clients to readily adopt the Internet banking medium for their banking transactions, bank managers must take a closer look at these determinant factors described in the study.

The study showed that the population group, educational and income levels exerted an influence on the perceptions clients have regarding Internet banking adoption factors. It was found that the higher the education and income levels of the clients, the easier it was for them to adopt Internet banking. Also, the male group dominated the use of the Internet banking. This is supported by the fact that there is a growing middle class in Ghana that falls within this category of banking clients.

KEY WORDS

banks; Internet banking; adoption; market share; technology acceptance model; diffusion of innovation; organisational variables; organisational efficiency; business strategy, perceived ease of use; perceived usefulness.

CHAPTER ONE
INTRODUCTION AND SCOPE OF THE STUDY

1.1 INTRODUCTION

In sub-Saharan Africa, developments in ICT are radically changing the way business is done. Electronic commerce is considered a new phenomenon in the banking industry that holds the promise of revolutionising the way banking transactions are being conducted by offering a cheaper and more direct way to exchange information and to sell or buy products and services (Abor, 2005:2).

(Coombs, Hall, Long & Scurlock, 1987:17) argued that many vibrant economies growth are attributed to innovations in information processing, telecommunications and related technologies which is collectively called “information technology” (IT). Technological innovation therefore affects not just banking and financial services but also chart the course of an economy and its capacity for sustained growth.

The government of Ghana has made a serious effort to pursue a “knowledge-based economy” agenda to make Ghana a preferred ICT destination since 2002, (Woldie, Hinson, Iddrisu & Boateng, 2008:35). The use of the Internet in Ghana has also seen significant increases since the liberalisation of the telecommunication industry in 1990s. The country at the end of June 2012 had 3,568,757 Internet users, representing a penetration rate of 14.1 per cent of the total population (IWS, 2012:4). A national ICT policy for accelerated development was introduced in 2003 with the objective of engineering an ICT-led socioeconomic development process. For a country which hitherto could clearly be described as sitting at the disadvantaged end of the global digital divide, it becomes important to ascertain how ICT is affecting the Ghanaian banking business, which also tends to contribute substantially to Ghana’s service sector revenues (ISSER, 2005:6).

Electronic banking (e-banking) has been purported by academic and practitioner-orientated literature as one of the means by which ICTs can and do impact on the banking sector (Gurau, 2002; Bradley & Stewart, 2003:274; Shih & Fang, 2004:214; Boateng & Molla, 2006:2). The phenomenon of e-banking refers to the deployment of banking services and products over electronic and communication networks directly to customers (Singh and Malhotra, 2004:1). The network encompasses automated teller machines (ATMs), direct dial-up connections, private and public networks, the Internet, televisions, mobile devices and telephones. In terms of service complexity, e-banking services include information push services where information is given to the customers about the bank, its products and services downloading of information services where customers can download account information and forms. These services also broaden to full transaction services where customers can perform most banking transactions such as transfers between accounts, bill payments, third party payments, electronic card and loan applications (Boateng and Molla, 2006:3; Singh and Malhotra, 2004:2).

The promise of the Internet and its application as the electronic and communication medium or channel for offering transactional banking services (Internet banking), offers the potential for improving the quality and timeliness of response from banks, facilitating self-service and service customisation, and improving customer communication and relationships (Gurau, 2002).

1.2 STATEMENT OF THE PROBLEM

Diffusion throughout the economy rather than the generation of new technology affects productivity growth at the macro level. Therefore timely diffusion of new technology from the perspective of the firm is an important success factor in obtaining economic growth (Malhotra and Singh, 2007:326). Studies by researchers such as Rogers (1983:5), Sullivan and Wang (2005:4) on the factors which determine

the adoption of new technologies have become very relevant in this modern day, taking into consideration the forces that govern the diffusion of innovations.

According to Barra (1990:221), the last four decades have witnessed acceleration in technological innovation in the banking industry and this increase is mainly attributed to defensive measures against increasingly sophisticated and highly demanding consumers. Throughout the literature, research relating to e-banking has been conducted in a multiplicity of contexts. E-banking research has been conducted in Europe (Daniel, 1999:3; Kardaras & Papathanassiou, 2001; Gurau, 2002:2; Karjaluoto, Mattila & Pento, 2002:4; Jayawardhena & Foley, 2000:19), Asia (Laforet & Li, 2005:364; Hway-Boon & Yu, 2003:372; Shih & Fang, 2004:213), and Australia (Sathye, 1999:324). A focus on Africa, and Ghana for that matter, in relation to Internet banking has been almost non-existent. A single notable study by Boateng and Molla (2006:1) analysed the use of the Internet in developing e-banking capabilities in Ghanaian banks. However, the study was based on an exploratory single case study, particularly focused on the strategies adopted by the bank in developing e-banking capabilities, and relatively failed to generate considerable insight into adoption of technology.

There are very few studies in this area especially in relation to a developing country on the diffusion of technological innovation such as Internet banking. The absence of suitable and sufficient knowledge on this topic exposes a “rhetoric versus reality” argument of whether the intention to adopt Internet banking is critical to the strategies and ultimate success of banks. In addressing this gap, the study will rely on empirical data to identify the factors that affect the intention to adopt Internet banking by banks in Ghana.

1.3 THEORETICAL AND CONCEPTUAL FRAMEWORKS

1.3.1 Theoretical Framework

Several models have been developed which aid the mapping of diffusion of innovation in various industries (Rogers, 1983:26; Barra, 1986:164). These studies identified the main factors that impact on the rate of diffusion of an innovation. Tidd et al. (1997:241) identify these as competitive advantage, reducing cost and protecting an organisation's strategic position. Bass (1990:27) also states that the uptake of a particular innovation may be influenced by the organisational structure and size, number of previous adopters and entry of new competitors to the industry.

One of the most frequently cited studies in relation to technology diffusion was conducted by Rogers (1983). Rogers developed a framework on the diffusion of innovations about three decades ago which has been successfully used to elucidate problems concerning the diffusion of innovation (Kautz & McMaster, 1994:279).

Rogers (1983:5) defines diffusion as follows:

> Diffusion is the process by which an innovation is communicated through certain communication channels over time among the members of a social system and an innovation is an idea, object or practice which is perceived as new by an individual or another unit of adoption.

Thus, the diffusion process is mainly a communication process or regarded as an information-seeking and processing activity. Also, innovations may emerge not just as single entities, but as closely related, hitherto apparent essentials of technology.

The innovation decision process, in which a decision-making component passes from the initial knowledge of an innovation to the point where the decision to adopt or reject is taken is vital to the diffusion of an innovation.

Rogers (1995:216), distinguishes between different mass media channels (such as radio, television, newspapers and the Internet) and interpersonal channels which involve face-to-face exchange between two or more people in informal conversations or in more formal meetings or seminars.

Another aspect of the framework of innovativeness as described by Rogers (1995:8) is the degree to which a unit of adoption is relatively earlier than other members of the system in adopting new ideas. The usefulness of identifying different groups of adopters lies in the possibility of defining different diffusion strategies. The normal frequency distribution of the adopter categories given by Rogers (1995:201) may also allow prediction of the progress of the diffusion process. Rogers (1995:234) also discusses the role of interpersonal networks, describing them as change agents. These change agents influence potential adopters' innovation decisions in a direction desired by a change agency.

In relation to Internet banking technology as a diffusion of innovation, Foley and Jayawardhena (2000:22), in a survey conducted in the United Kingdom on Internet banking facilities, revealed that Internet banking adoption was happening at a very slow pace and that the drivers of such change in the banking industry were ambiguous about the process. The authors comment: “It is very difficult to establish up to what point innovation has been a management objective and how far it has been influenced by factors beyond management control”.

The above depicts aspects of the communication composition as presented by Rogers (1995:198), but the content of the communication of the innovation itself is of equally important. The apprehension of the following attributes also affects the rate at which an innovation is adopted:

- The degree to which an innovation is perceived as being better than the idea it supersedes (relative advantage);

- The degree to which an innovation is perceived as being consistent with existing values, beliefs, experience and needs (compatibility);
- The degree to which an innovation is perceived as being difficult to understand and use (complexity);
- The degree to which an innovation may be experimented with on a limited basis (trialability); and
- The degree to which the results of an innovation are visible (observability).

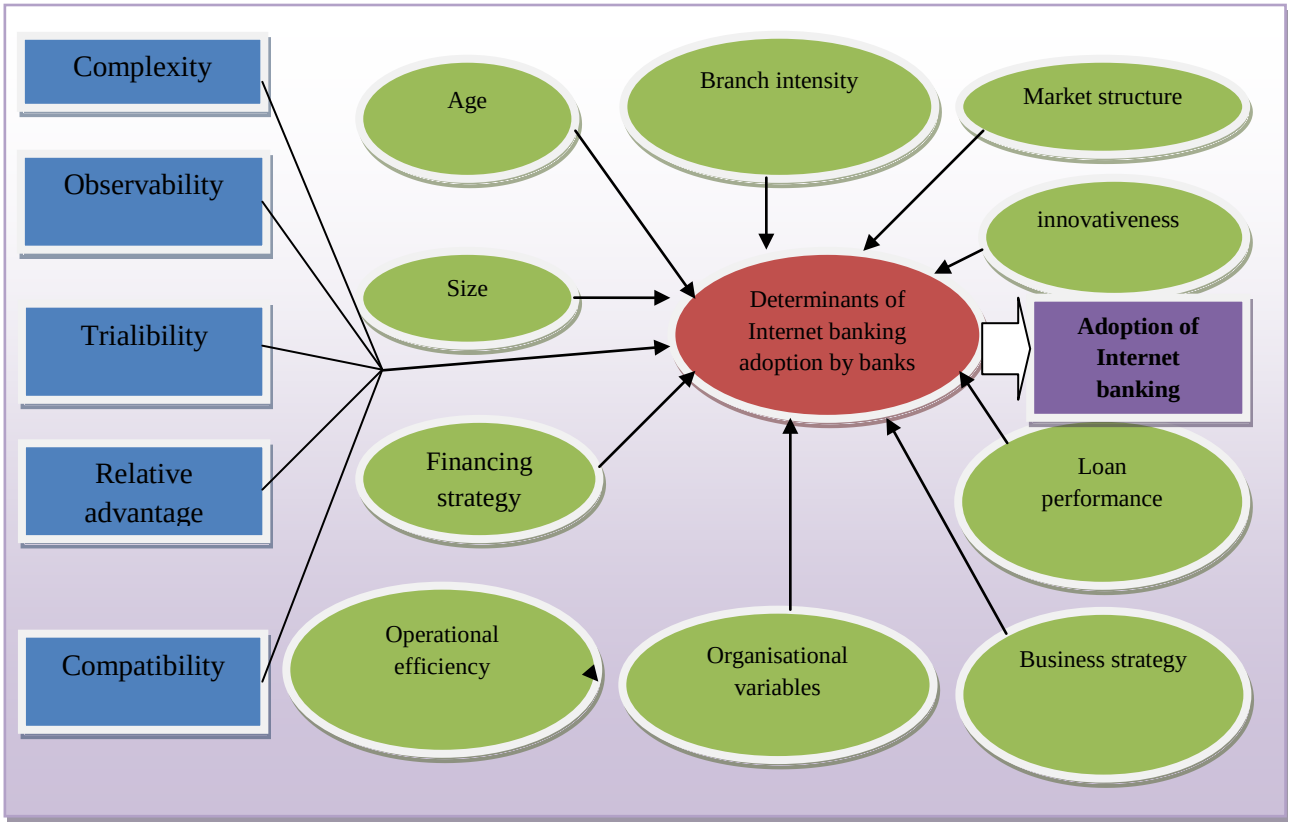
The better the perception of these attributes, the higher are the chances of a successful adoption of an innovation.

Malhotra and Singh (2007:324) are also of the view that as a consequence of increasing importance of modern information and communication technologies for the delivery of financial services, the analysis of the determinants of Internet banking adoption has become a growing area of interest to both researchers and managers. They propose various push and pull factors including various technology, environment and market structure variables that identify those characteristics of the bank which affect the bank's decision to adopt Internet banking.

Finally, Rogers (1983:167) acknowledges that diffusion is not only understood by starting to look at the process when the first knowledge is consciously spread or when the first adopters take up an innovation; the events and decisions occurring prior to this point also have a considerable influence upon the diffusion process.

Malhotra and Singh (2007:325) outline different factors that can affect a bank's decision in adopting Internet banking. These factors are size, age of the bank, financing strategy, operational efficiency, profitability, branch intensity, organisational variables, business strategy, loan performance, innovativeness, overall safety index, market structure, market characteristics and economic conditions.

Figure 1.1: Schematic representation of diffusion model



Source: Adapted from Rogers (1983;1995); Malhotra and Singh (2007)

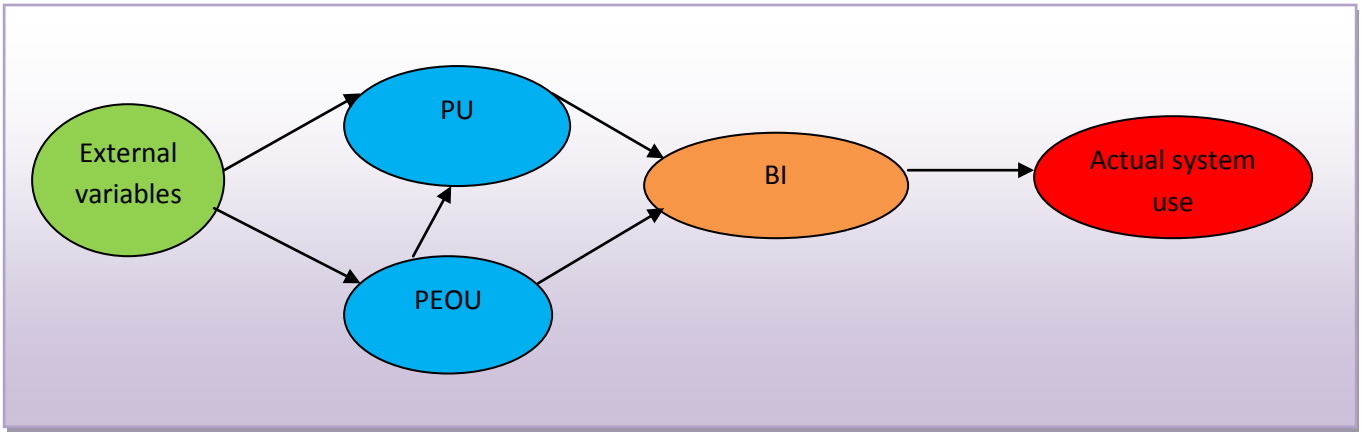
Another theoretical underpinning of the research will be the use of the technology acceptance model (TAM) (Davis, 1989:8; Davis, Bagozzi, & Warshaw, 1989; Venkatesh & Davis, 1996; Venkatesh & Davis, 2000a; Venkatesh, Morris, Davis, & Davis, 2003).

TAM was an extraction from the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980) and the theory of planned behaviour (TPB) to explain computer acceptance. According to TAM, a person's belief determines his or her attitude towards thinking. An attitude is said to be a kind of perceived behavioural control (PBC) and its enhancement will positively influence behavioural intentions (BI) and result in actual behaviour. The original TAM suggests that two beliefs, namely perceived use (PU) and perceived ease of use (PEOU), are instrumental in

explaining the variance of the customer's attitude. PU together with the customer's attitude determine that customer's BI. PU is defined as the degree to which a person believes that using a particular system would enhance his or her performance, while PEOU is defined as the degree to which a person believes that using a particular system would be free of effort. Furthermore, PEOU is also hypothesised to be a predictor of PU (Venkatesh & Davis, 2000:192). These two factors can be easily understood by system developers and can be taken into account during system requirement analysis and other system development stages.

The original TAM proposed by Davies (1985:12) suggests that users' motivation can be explained by three main factors, these being PU, PEOU, and attitude towards using the system. Later, as depicted in Figure 1.2, other variables such as behavioural intentions were included in TAM by Venkatesh and Davis (1996:453). These authors were of the view that external variables such as trust, security, financial cost, demographics and location had an impact on the adoption of technology.

Figure 1.2: Schematic representation of extended TAM



Source: Adapted from Venkatesh and Davis (1996)

In TAM, the independent constructs of PU and PEOU are instrumental in explaining the variance in users' intentions to use information systems (IS) (Ogwang, 2009:13).

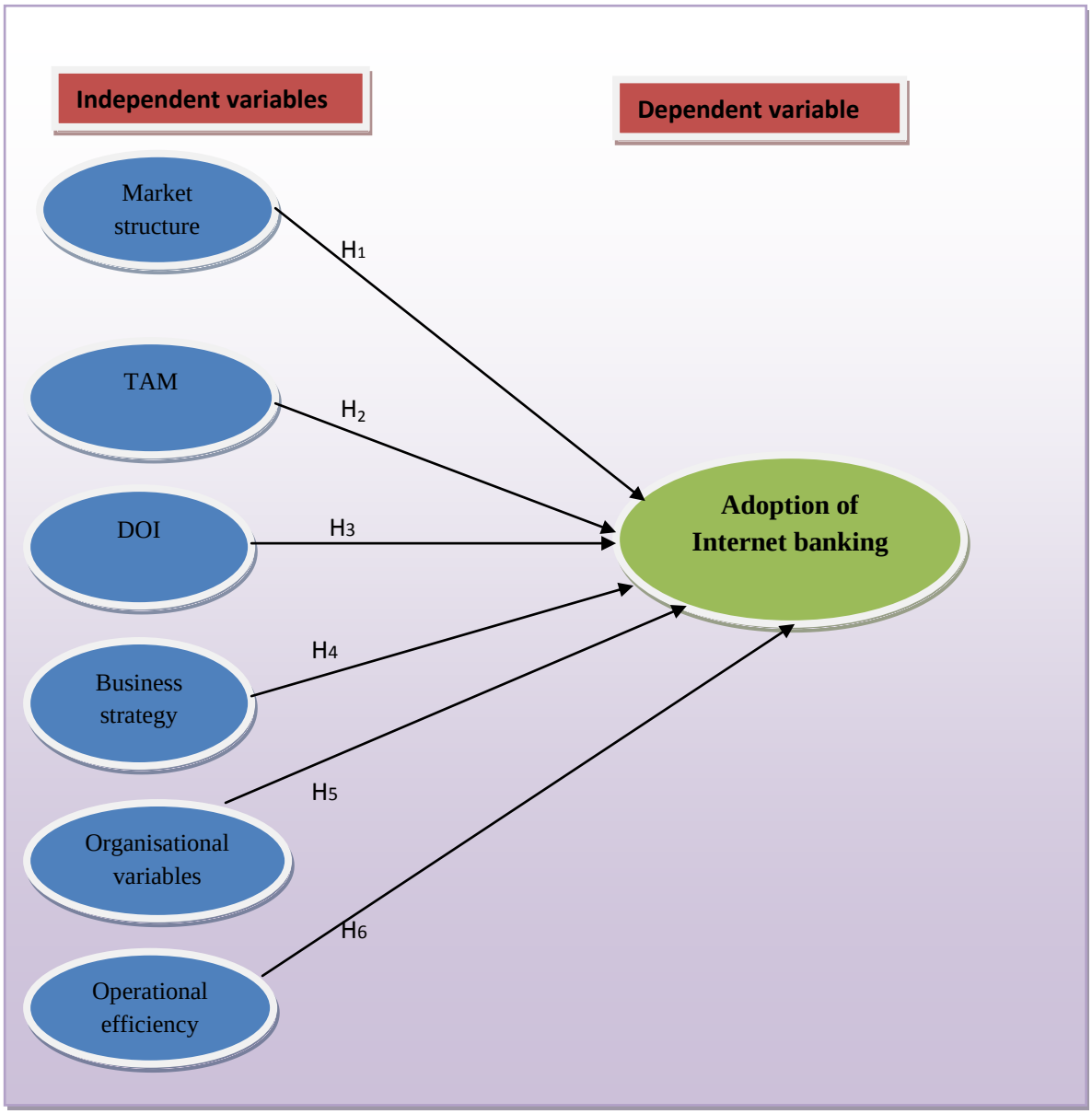
Furthermore, PU and PEOU are influenced by external variables (Ogwang, 2009:14). Davis et al. (1989:987) point out that the primary independent constructs of TAM (PU and PEOU) do not fully reflect the specific influences of technological and usage context factors which may alter user acceptance. Therefore, the model for this research will be the extended TAM, which includes other adoption theories such as Rogers' (1995:1) innovation adoption theory, and other behavioural theories, namely the Triandis model (Triandis, 1980:2), theory of self-regulation (Bagozzi, 1992), theory of reasoned action, and the TPB (Ajzen, 1991). Further developments by Limayem et al. (2000:424) will be also utilised for the purposes of this study.

1.3.2 Conceptual model

An expectation exists that a universal decision to adopt Internet banking by the banks will enable customers to adopt this medium of transaction, thereby reducing the brick-and-mortar banking being operated.

It is assumed that the likelihood of an individual using formal financial services (banking services) would be enhanced if they adopted mobile money services. However, the impact of the independent variable (Internet banking adoption) on the dependent variable (banking services) could be mitigated by factors such as bank profitability, volume of transactions, Internet penetration rate, friendliness of the regulatory environment as well as the rate of IT deployment. In addition, previous circumstances like historical perceptions of the Ghanaian banking system, and existing alternatives such as ATMs, telephone banking and other e-banking channels could influence the dependent variable (banking services).

Figure 1.3: Proposed conceptual model



Source: Researcher's own construction

1.4 RESEARCH OBJECTIVES OF THE STUDY

This research has two main objectives, namely a primary objective of the study and secondary objectives.

1.4.1 Primary objective

The primary objective will focus on investigating the adoption of Internet banking by banks in Ghana through the use of current theories on organisational characteristics and behavioural theories.

1.4.2 Secondary objectives

The secondary objectives of the study are to:

- Evaluate the determinants of Internet banking adoption by banks;
- Identify the factors affecting banks' decision-making processes in Internet banking adoption;
- Discuss the concept of Internet banking and Internet banking in Ghana; and
- Developing a firm-level framework of Internet banking

1.4.3 Hypotheses

As indicated in Figures 1.1 and 1.2, the relationships between the various measures and constructs in the diffusion model as well as the extended TAM model can be stated in the following hypotheses which will be tested in this research. Table 1.1 depicts the various hypotheses underpinning the research.

Table 1.1: Research hypotheses

Hypothesis	Description	Source
H1	A bank with a larger market share has an influence on the adoption of Internet banking	Courchane et al. (2002a, 2002b); DeYoung et al. (2007); Sullivan and Wang (2005)
H2	A bank's perceived way of accepting technology has an influence on the	Davis (1989); Davis et al. (1989)

Hypothesis	Description	Source
	adoption of Internet banking	
H3	A bank's diffusion of innovation variables has an influence on the adoption of Internet banking	Rogers (1995)
H4	A bank's business strategy (deposit) has an influence on the adoption of Internet banking	Sullivan and Wang (2005); Malhotra and Singh (2007)
H5	A bank's organisational variables have an influence on the intention to adopt Internet banking	Sullivan and Wang (2005); Malhotra and Singh (2007)
H6	A bank's operational efficiency has an influence on the adoption of Internet banking	Sullivan and Wang (2005); Malhotra and Singh (2007)

1.5 SIGNIFICANCE OF THE STUDY

Hinson (2004:48) developed a small and medium-sized enterprise (SME) Internet benefit model and advanced the argument that the Internet has benefits for exporters. Mansel, Humphrey, Paré and Schmitz (2004:30) also contend that "the Internet is becoming an important business tool". However, in order to realize the full benefit or potential of the Internet, there are certain important factors that must be taken into consideration such as the organisational ability to make use of the technology, attitude of management, resource availability and knowledge issues (Chircu & Kauffman, 2000:67; Farhoom, Tuunainen & Yee, 2000). According to Chircu and Kauffman (2000:69), the lack of adequate information technology infrastructure remains a critical barrier to supporting the continual growth of online commerce. Hinson (2005:23) argues that firms in Ghana need to better strategise to take advantage of the Internet. Moorman, Deshpande and Zaltman (1993:91) observe that lack of customer trust in the web system could restrict the opportunities to be gained from web technology.

Lee and Turban (2001:77) contend that customers of banks often do not trust Internet technology for three reasons: security of the system, misgivings about the service providers, and issues with how reliable the Internet is. Concern about security is one common factor related to unwillingness to use the Internet channel for commerce. Security breaches can lead to numerous problems such as destruction of operating systems, or disruption of information access (Min and Galle, 1999:913). The use of the Internet in delivering banking services is pervasive in Western developed contexts. Internet banking is however just beginning to blossom in West Africa and Ghana in particular.

A small but growing number of studies on innovation have investigated the diffusion of financial services (Gerrard & Cunningham, 2003b:16). This small number of studies is surprising, taking into consideration that the world's leading banks continue to develop new financial services or modify their existing services. With an increasing number of banks offering Internet banking, this recently introduced service is an ideal choice upon which to conduct a diffusion study. Studies which investigated the adoption of Internet banking are of interest to both academics and bank management.

Academics are also interested in modelling the processes by identifying all relevant characteristics in determining the extent to which adopters view these characteristics, and in finding out to what extent do adopters view these characteristics vis-à-vis non-adopters.

1.6 RESEARCH DESIGN, DATA, AND ANALYSIS

1.6.1 Research design

1.6.1.1 *Research philosophy*

"Research is confounded by a failure to ask the question: 'What do you mean?'" (Pring, 2012:23). Wittgenstein (1953) in Pring, (2012:23) argues that "What do you mean?" is the basis of the philosophical underpinnings of a research that enables

one move from “a piece of disguised nonsense to patent nonsense”. A research philosophy confers conceptual meaning to variables (Pring, 2012:29), enabling a researcher to distinguish between adequate or true knowledge and inadequate or false knowledge (epistemology) (Heylighen, 1993:1) as well as ontology (what constitutes reality and how can we understand existence?) (Raddon, 2010:2).

A pragmatic approach to social research involves using the method which appears best suited to the research problem and not getting caught up in philosophical debates about which is the best approach. Pragmatic researchers have the liberty to adopt the use of any of the methods, techniques and measures characteristically connected with quantitative or qualitative research. It recognises that every method has its limitations and that the different approaches can be complementary (Dash 1993:2). It also uses different techniques at the same time or one after the other. For example, it might start with face-to-face interviews with several people or have a focus group and then use the findings to construct a questionnaire to measure attitudes in a large scale sample with the aim of carrying out statistical analysis (Cohen, Manion & Morrison, 2000:246).

Depending on which method is adopted, the data collected is analysed in the appropriate manner. However, occasionally, it is probable to convert qualitative data into quantitative data and vice versa, although converting quantitative data into qualitative data is not very common in research.

In order to meet the research objectives of this investigation, the pragmatic research paradigm is the best fit due to the fact that it is able to mix different approaches and has the advantages of enabling triangulation. The choice was also informed by the following criteria identified by Hussey and Hussey (1997:47) regarding a positivism paradigm where it produces quantitative data that would fit well with hypothesis testing which requires stringent statistical analysis to assess the assumed cause-and-effect / correlational relationships between the dependent and independent variables; the data is precise; reliability is high; and validity is low.

1.6.1.2 *Research method*

It has been found that the exclusive use of one method militates against the cross-checking of data (Georgellis, Joyce & Woods, 2000:9). Therefore, it is a fundamental tenet of this research that the use of multiple methods should make it possible to escape from some of these research challenges. It should also enable a break in the trend of research of small firms to focus on either macro or micro influences. In addition, the use of a "between-methods" triangulated design is novel (Hill & McGowan, 1999:15). Siu and Kirby (1999:135) support this view by proposing that the quest to develop a research design which fit the study is more important than the debate about whether or not to adopt a quantitative or qualitative approach for a study. But the combination of research methods, namely preliminary research to explore the issue, then a quantitative research to categorize the substantive context, as well as the qualitative research to offer an in-depth knowledge (Siu & Kirby, 1999:136) is more preferable in such study.

1.6.2 Sample size

Ruyter and Scholl (1998:8) indicate that, due to the amount of information that may be acquired from interviews, there is the need to carry out a small number of interviews to obtain the desired level of information from the respondents in a study. With this in mind, the chief executive officers (CEOs), managing directors (MDs) or e-banking managers of twenty four (24) of the universal banks were approached for this study, representing 86 per cent of the total number of universal banks in Ghana. Names of the respective banks were picked by simple random sampling. All the names of a sample frame were drawn from a hat. All the sample frames were accessible to other researchers and replicable (Zairi, 1990:29). CEOs/MDs or e-banking managers were used because, as opinion leaders (Rogers 1995:280), they are likely to be recipients of diverse information, and would thus be most cognisant of their environment.

1.6.3 Data collection methods and instruments

1.6.3.1 *Data collection methods*

Yin (2003:85) proposes that there are six sources of evidence useful in research, namely documentation, archival records, interviews, direct observation, participant observation and physical artefacts. Each source has its strength and weaknesses, and the richness of case study evidence is based largely on this multiple-faceted perspective yielded by using different sources of evidence. Based on the above, the data collection methods used include interviews using questionnaires, and documentary analysis.

Yin (2003:90) further identifies three types of interviews, these being open-ended interviews, focused interviews and structured interviews. Focused and open-ended interviews are adopted for this research with the use of a questionnaire, together with semi-structured, convergent, in-depth interviews which centre on the constructs and their measurements in Ghana. These interviews aimed to identify the key themes and issues relating to the diffusion of the Internet and its adoption by banks. Personal interviews are used to afford greater exploration and time to delve into major emerging issues (Saunders, Lewis & Thornhill, 2000). Other variables of the bank's decision regarding diffusion of technology will be explained further. This method is used to test the models because it provides a basis for establishing generalisation and allows for replicability (Teo, Wei & Benbasat, 2003). The documents analysed include annual reports and corporate strategy documents of the 15 universal banks as well as Internet banking product brochures developed by these banks. Websites of the various banks were also studied.

1.6.3.2 *Data collection instruments*

A questionnaire is the instrument used in data collection, as it is a predetermined written set of related sequential questions designed to collect information from a respondent (Mbaaga, 1990). It is also said to be "a set of systematically structured questions used by a researcher to obtain required information from respondents"

Brown, (2001:6). Questionnaires are “any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers” Brown, (2001:6).

Questionnaires usually tackle three main areas. These are behavioural (dealing with both past and present deeds of the respondent), attitudinal (comprising of world views, people's opinions, attitudes, beliefs and values) and finally, factual which is made up of demographic information, ones socio-economic status and educational level of the respondent.

Demographic characteristics in this research include gender, region of origin, age, level of education, job position and frequency of using the Internet. The behavioural questions cover the following determinants of adoption: PEOU, PU and BI, while the attitudinal questions examine items such as attitude towards use, actual use, perceived system quality, trust, perceived security, and perceived financial cost. The questions that gauge the constructs which influence adoption are assessed on a 7-point Likert scale**.**

1.7 DATA ANALYSIS

1.7.1 Reliability and validity

For the purpose of the research, the concepts of construct validity, external validity, and reliability are adopted. In defining the quality standard of any given research, validity and reliability concepts have been developed to check the quality of the research. This also applies to case study research. According to Yin (2009:41), there are four main quality standards to consider in case study research and these are construct validity, internal validity, external validity and reliability.

Table 1.2: Validity and reliability in case study research

Test	Case study tactics	Phase of
Construct validity	• Use multiple source of evidence	Data collection
	• Establish chain of evidence	Data collection
	• Have key informants review draft	Data collection
Internal validity	• Do pattern matching	Data analysis
	• Do explanation building	Data analysis
	• Address rival explanation	
	• Use logic models	Data analysis
External validity	• Use theory in single case studies	Research design
	• Use replication logic in multiple	Research design
Reliability	• Use case study protocols	Data collection
	• Develop case study database	Data collection

Construct validity is where the researcher establishes correct operational measures for the concepts being studied. Yin (2009:41) finds that there is a need for the researcher to meet certain criteria which are to select the specific types of changes that are to be studied and relate them to the original objective of the study.

The concept of internal validity according to Patton (1990), is where the conduct of the study is done such that inferences from the data are accurate or valid. This presupposes that this study will be conducted in a way that extraneous factors or events such as data collection bias and data collection characteristics are ruled out in the interpretation of the data.

External validity on the other hand, deals with knowing whether the findings of the study can be generalised beyond the specific case study, thus, to establish whether the findings of the study can be tested in a similar situation using another case study.

However such generalisation can only be made on an analytical basis where a theory must be tested by replicating the findings (Yin, 2009:43).

Converse and Presser (1986) stress the importance of piloting a questionnaire; they also suggest consulting with professional experts and cultural insiders on the structure and content before using the document. Accordingly, this research questionnaire is referred to several academics in a faculty. Here, about two to four of sorting the questions are performed, each involving four judges who are faculty members or PhD students. All the feedback received is used to make important changes to the interview guide.

Reliability is tested when another researcher follows the same procedure to conduct the research; it is then assumed that the later researcher's results will not differ from those of the earlier research conducted (Yin, 2009:45; Riege, 2003). Reliability is achieved by documenting all the various steps used in conducting the research.

1.7.2 Structural equation modelling (SEM)

SEM has become one of the techniques of choice for researchers across disciplines and increasingly is a "must" for researchers in the social sciences. In this study, SEM will be the main method used for analysing the research model and hypotheses. SEM according to Hair et al. (2010:607) is a "collection of statistical models that seek to clarify the correlation between several variables". Thus it examines the composition of interrelationships expressed in a series of equations, similar to a series of multiple regression equations. Kaplan (2000:1) proposes that:

> Structural equation modeling can perhaps best be defined "as a class of methodologies that seeks to represent hypotheses about the means, variances and covariances of observed data in terms of a smaller number of 'structural' parameters defined by a hypothesized underlying model".

Li (2001) points out that SEM conducts the analysis of both the measurement model and the structural model at the same time. The structural model is examined in terms of model goodness-of-fit, overall explanatory power, and postulated individual causal links (Hu, Chau, Liu & Tam, 1999:103). Nachtigall, Kroehne, Funke, and Steyer (2003:3) contend that SEM is very easy to adapt, due to the fact that it takes into consideration a single or multiple linear regressions as well as a system of regression equations. IBM's Amos software which utilises the maximum likelihood estimation technique is used for testing the SEM.

1.7.3 Grounded theory

The interview data is analysed using some of the principles of grounded theory, the strength of which is that it helps to account for variation in the phenomena studied (Strauss 1988:87). Data collection and interpretations are guided by successively evolving interpretations made during the course of the study which may lead to the formation of theory (Gummesson, 1994:81). The grounded theory developed by Strauss and Glaser (1967) has been found to be very time-consuming and difficult to apply (Hill and McGowan, 1999:13), hence the procedures put forward by Easterby-Smith, Thorpe and Lowe (1991:103) are used in this study. These procedures include familiarisation with the data, reflection on the data and on any themes which emerge, conceptualisation, cataloguing concepts, recoding of concepts, linking concepts, and re-evaluation.

This process also facilitates a synthesis of the quantitative and qualitative methods, allowing a return to the case study data to seek clarification of findings, or allowing a return to the quantitative data to generate more macro-data (Hill and McGowan, 1999:14).

1.8. SCOPE OF THE STUDY

The way in which ICT adoption and implementation occur, differs considerably with regard to location, business sector, relative size and type of operation (Martin & Matlay, 2001:403). Therefore, the geographical area for this research study focuses on universal banks in Ghana either as private or public banks because the decision to adopt may have more to do with the institutional environment in which a bank is situated than with the rational intra-organisational and technological criteria.

Although adoption may depend on some proven factors such as high cost, lack of experience with technology and lack of relevance and flexibility (Hughes, Golden & Powel, 2003:282), or current and potential employees who may restrict the adoption of technology (Daniel & Wilson, 2002:334), the study will not investigate the nature and type of e-banking technology.

For an organisation to make full use of the deployment of Internet banking technology, the initial issue is to adopt and later implement the technology. However, this study will explore only the adoption issues.

1.9. DEMARCATION OF THE STUDY

The thesis is divided into six chapters.

Chapter One provides the background and contextualisation of the research, a statement of the problem, and outlines the objectives and significance of the study.

In *Chapter Two*, a review of literature on diffusion innovation theories together with the theories of reasoned action, planned behaviour and self-regulation provides a theoretical basis for the study and develops a conceptual framework.

Chapter Three reviews empirical studies regarding the adoption of Internet banking in developing countries in particular, and developed countries in general.

Chapter Four will deal with the methodology, referring to the description of the study area, sampling procedure, collection of data, analysis, and interpretation of the data.

Chapter Five contains the presentation and discussion of results.

In the final chapter, *Chapter Six*, the implications of the study for theory, policy, and practice as well as the recommendations and conclusions will be presented.

CHAPTER TWO
INDEPENDENT VARIABLES OF THE STUDY

2.1 INTRODUCTION

This chapter presents a detailed theoretical discussion regarding Internet banking adoption. As stated in Chapter One, the primary objective of this study is to empirically test the conceptual model pertaining to the factors that influence the adoption of Internet banking in Ghana. The conceptual model aims to identify the variables influencing the adoption of Internet banking from both the bank's and the customer's viewpoints. This chapter therefore addresses part of the secondary research objectives and focuses on the presentation of various theories indicated in Chapter One such as TAM, TRA, TPB, diffusion of innovation (DOI), extended TAM (TAM2), and decomposed theory of planned behaviour (DTPB).

These theories still remain popular and empirically relevant for this study; this chapter therefore makes references to the original theories. The chapter commences by taking an overview of TAM from its origins to the present day and observing how much influence it has exerted on the perception of technology adoption, especially Internet banking. All the relevant variables in the theories stated above are considered to determine their impact on Internet banking adoption and how they affect both the customer and the bank. A summary and conclusion will be provided at the end of the chapter.

2.2 THEORETICAL FRAMEWORK FOR THE STUDY

2.2.1 Technology acceptance model (TAM)

TAM was introduced by Davis (1986:3) as an adaptation of the TRA which was purposely modified for modelling user acceptance of information system. Chuttur (2009:2) notes that although many models have been proposed to explain and

predict the use of a system, TAM has been the one to capture most of the attention of the IS community. According to Ying-Feng Kuo and Shieh-Neng Yen (2009:106), TAM is intended to provide a conceptual model featuring a theoretical foundation and parsimony, to explain and predict the behavioural intention and practical behaviours of information technology users, based on the acceptance and use of information technology. TAM is generally referred to as the most influential and commonly employed theory in IS (Lee, Kozar & Larsen 2003:760).

TAM has been largely used to predict the intention of users to accept or adopt a variety of technologies and IS, and has also recently been used to predict Internet and mobile commerce adoption (Lin & Lu, 2000:205; Moon & Kim, 2001:221; Heijden et al., 2003:42; Yang, 2005:258; Luarn & Lin 2005:875; Wu & Wang, 2005:720). Davis (1986:3) believes that a potential user's overall attitude to a given system is a major determinant of whether or not the user actually uses it. In addition, attitude towards using the technology or innovation is, in turn, a function of two major beliefs, namely PU and PEOU. Consumers will patronise a new technology when it is relatively better than previous ones and simpler to use. Davis further postulates that PEOU has a causal effect on PU in the sense that the design features of a technology directly influences usefulness and PEOU. Design features were not theorised to have a direct effect on attitudes or behaviour in agreement with the Fishbein paradigm. The Fishbein paradigm proposes instead that design features affect attitudes or behaviours only indirectly through PU and PEOU.

"Use" according to Fishbein and Ajzen (1975:238) refers to an "individual's actual direct usage of the given system in the context of the user's job". Use therefore, is a repeated, multiplied act or behavioural criterion that is specific with respect to a target (specified system), action (actual direct usage) and context (in person's job), and non-specific with respect to timeframe. Although attitude has been conceptualised in several ways in social science research (Dillard, 1993), at any point in history it has been linked to emotional, behavioural and cognitive processes (Breckler & Wiggins,

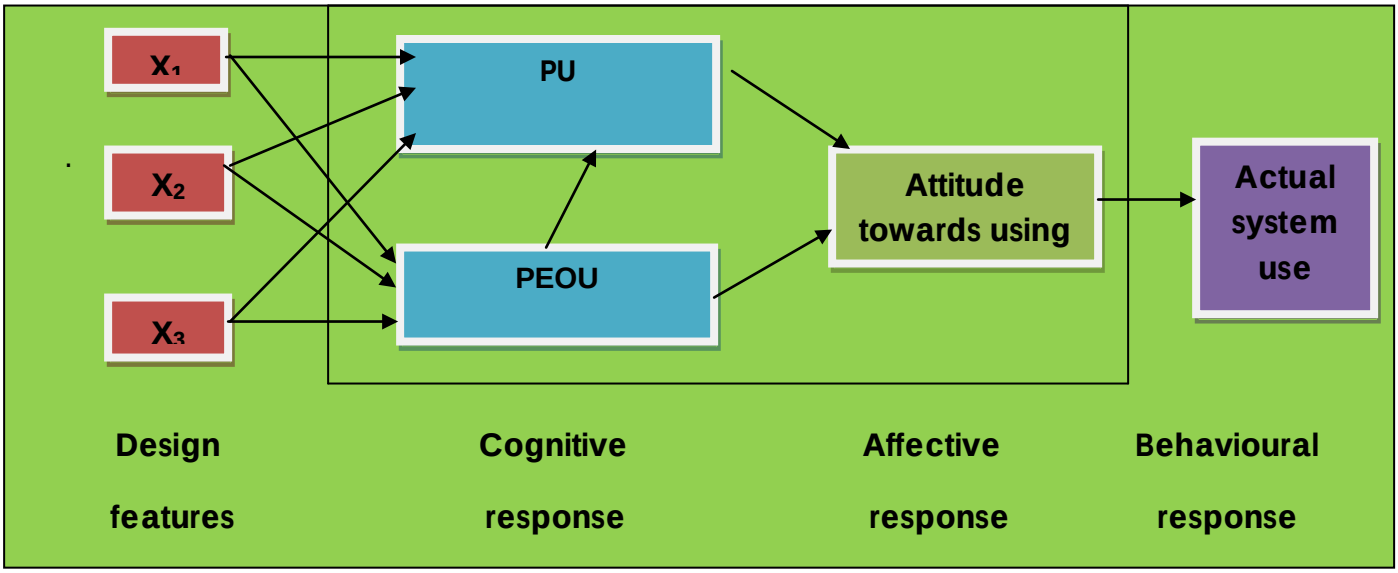
1989:408). Petty and Cacioppo (1981:125) have defined attitude as “a general and enduring positive or negative feeling about some person, object, or issue”. Revisions to the definition of attitude by other scholars continue to hold emotion, behaviour and cognition central. TAM therefore explains the relationship between these internal psychological variables (Davis, 1986:4 & 1989:320). There have however been subsequent criticisms of TAM (Venkatesh & Davis, 1996:203 & 2000:230,b; Venkatesh et al., 2003:428), with the argument that the role of attitude in explaining behavioural intention or actual adoption behaviour is very limited and is at best a partial mediator in the relationship between salient beliefs and the adoption behaviour or intention.

Attitude refers to the “degree of evaluative affect that an individual associates with using the target system in the user’s job” (Fishbein & Ajzen, 1975:78). The definition and measurement of attitude match specifically with those of the behavioural measure as stated by Ajzen and Fishbein (1977:77). Davis (1986:4) explains that users’ motivations can be explained as illustrated in Figure 2.1. TAM explains that a user’s acceptance of a technology is dependent on two factors: PU and PEOU. The interrelationship of these two factors determines the attitude towards using the technology. In effect, the behavioural intention to use then leads to actual technology use. Davis (1986:6) defines PU as “the degree to which an individual believes that using a particular system would enhance the user’s job performance”. Users will be inclined to use or not to use a technology to the extent that they believe it will help them perform their jobs better. People want to finish their task on time, and so when a given technology can guarantee early completion and improvement, they will use it.

Davis (1986:6) hypothesised PEOU to have a significant direct effect on PU, in that a system which is easier to use will result in increased job performance (greater usefulness) for the user. PEOU is also defined by Davis as “the degree to which an individual believes that using a particular system would be free of physical and mental effort”. In other words, all other things being equal, a technology perceived to

be easier to use than another is more likely to be more accepted by users. The choice to use must therefore be relative to others. Venkatesh (2000:205) also indicates that PEOU "describes the individual's perception of how easy the innovation is to learn and to use". Davis and Arbor (1989:89) add that users believe a given application may be successful, but at the same time difficult to use when the performance benefits of usage outweigh the effort of application. Given that a non-triva fraction of a user's total job content is devoted to physically using the system, if the user becomes more productive in that aspect of his or her job through greater ease of use, then he or she becomes more productive overall. Thus, characteristics of the system may indirectly influence usefulness by affecting ease of use.

Figure 2.1: TAM



Source: Davies (1980)

Adopting TAM as one of the models for this research will help to provide some of the facts of what is perceived to work and what does not when informing the decision-making processes of Internet banking adoption. Given the desire of bank managers to remain competitive or attain some form of competitive advantage from the use and application of IS such as Internet banking, TAM is one of the few theories in the IS/IM

research community suitable for such research, (Lee et al., 2003:753). Also TAM does not suffer from any grafting or embedding problems when transplanting non-IS/IM theories to the domain of IS/IM. Supporting the work of Chan and Lu (2004:138), the intention to use the Internet for banking transactions can be considered the major construct of TAM, which theorises that PU and PEOU determine actual intentions and behaviour (Davis, 1989:320), adding a useful contribution to the knowledge base pertaining to Internet banking in Ghana.

2.2.2 Theory of reasoned action (TRA)

The TRA model was an integration of a number of previously disjoint theories concerning the relationships between beliefs, attitudes, intentions and behaviour from Dulaney's (1961:89) theory of propositional control, which was developed in the context of laboratory experiments on verbal conditioning and concept attainment. Fishbein and Ajzen (1975:239) expanded on this model in relation to the major existing theories which were learning theory (Doob, 1947:230; Staats & Staats, 1958:365); expectancy value theory (Atkinson, 1957:360; Ewards, 1954:982; Rotter, 1954:172, Tolman, 1932:132); consistency theory (Festinger, 1957:320; Heider, 1946:162; Rosenberg, 1960:173), and attribution theory (Heider, 1958:98; Jones & David, 1965:87; Kelley, 1967:21). The model was similar in structure to other major motivation theories (Vroom, 1964:843; Weiner, 1985:126). In addition, the model was very explicit regarding the definitions of operationalisation of and causal relationships between the variables being addressed, compared to many relationships between the variables being addressed.

TRA explains and predicts people's behaviour in a specific situation. Since the introduction of TRA to behavioural research, it has been applied to research in several fields of study and is now regarded as one of the most influential theories about volitional human behaviour (Trafimow & Finlay, 1996:821). According to Ajzen et al. (2007:23), TRA has also provided a framework for the resurgence of the

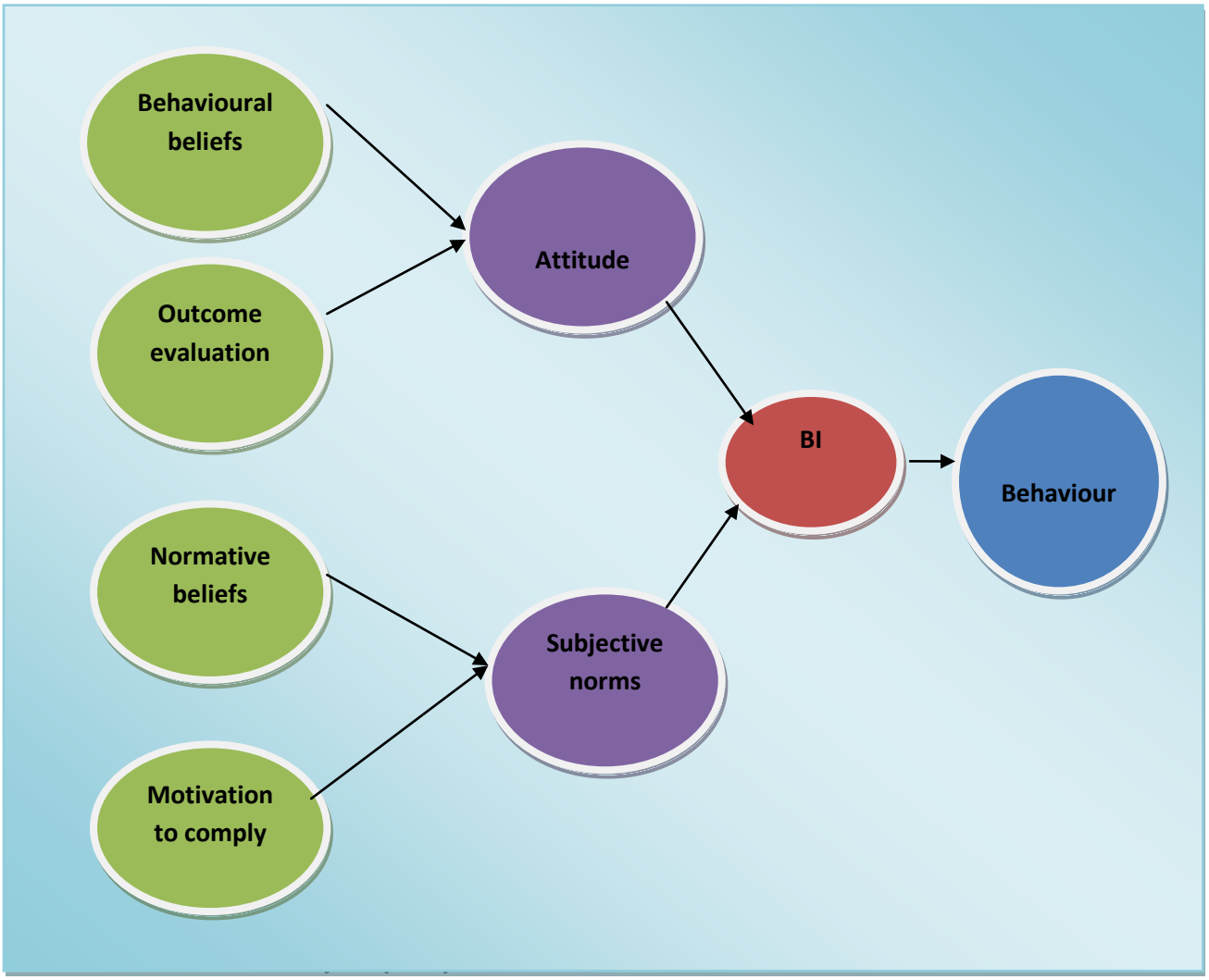
attitude construct and it has been fundamentally influential in subsequent research regarding attitudes and behaviour.

According to TRA, the behavioural intention (BI) of an individual is a measure of the strength of one's intention to perform a specified behaviour. BI is determined by two factors: 1) attitude towards the behaviour – which is a function of beliefs that performing the behaviour possesses certain attributes and the evaluation of those beliefs, and 2) subjective norm – which is the perception of social groups, in other words, what specific individuals or groups think that a person should or should not perform (Belleau et al., 2007:283).

An individual's subjective norm (SN) is determined by a multiplicative function of his or her normative beliefs (nbi), i.e., perceived expectations of specific referent individuals or groups, and his or her motivation to comply (mci) with these expectations. (Fishbein & Ajzen, 1975:302)

The subjective norm refers to a person’s perception of the social pressures to perform or not to perform a particular behaviour. An individual’s behaviour is determined by whether important referents approve or disapprove of the performance of behaviour, weighted by his or her motivation to comply with those referents. In summary, people are likely to perform a behaviour when they evaluate it positively and believe that significantly, others think they should perform the behaviour (Ajzen & Fishbein, 1980:95; Fishbein & Middlestadt, 1989:658; Montano & Kasprzyk, 2002:545). The interrelationship of the two factors is illustrated in Figure 2.2 below.

Figure 2.2: TRA



Source: Fishbein and Ajzen (1975)

Fishbein and Ajzen (1975:239) point out that "although a person may hold a relatively large number of beliefs about a given object, it is only a relatively small number of beliefs that serve as determinants of his attitude at any given moment". They refer to those beliefs that exert influence on one's attitude as salient beliefs. They acknowledge that extracting salient beliefs for performing target behaviour from users may yield only the first two of three beliefs. Subsequent individual beliefs elicited

beyond this point may not be primary determinants of his attitude. Unfortunately, it is impossible to determine the point at which a person may start eliciting non-salient beliefs (Fishbein & Ajzen, 1975:239; Miller, 1956:13; Woodworth & Schlosberg, 1954:321; Mandler, 1967:242). Fishbein & Ajzen, 1975:239 suggest that an "individual is capable of attending to or processing only five to nine items of information at a time" since the set of salient beliefs is expected to vary across individuals.

Fishbein and Ajzen (1975:238) state that in order to obtain a correct specification of the causal determinants of behaviour, the psychological variables of the model should be defined and measured at a level of specificity that corresponds to the behaviour criterion to be explained. Therefore, the variables of the model should be worded in a way that is parallel to the target behaviour in terms of target, action, context, and timeframe elements. Ajzen and Fishbein (1980:85) suggest that the only measure of intention that corresponds exactly to this behavioural criterion is to measure a person's intention "to purchase a set of items in a given time frame". Similarly, Fishbein and Ajzen (1975:76) argue that the relationships between beliefs, evaluation, attitudes, subjective norm, normative beliefs and motivations specified by the model will only be obtained if these elements correspond in specificity with the behavioural norm.

The authors (1975:77) maintain that the determinant of a person's behaviour with respect to a target object is the person's attitude toward performing the behaviour with respect to the object (A_{act}), and not their attitude toward the object per se ($A_{o)}$. A_{act} therefore corresponds in specificity to the behavioural criterion in terms of the action element, whereas A_o does not. In their 1974:67 work, Fishbein and Ajzen demonstrated that although A_o is strongly linked to general patterns of behaviour relative to the attitude object, it is much less able than A_{act} to predict specific behavioural criteria involving the object.

The expectancy value attitude models by Peak (1955:13), Rosenberg (1956:376) and Fishbein (1963:132) were all object-based, not behaviour-based attitude models. Hence, the belief structures being dealt with pertained to the perceived attributes of the object as opposed to anticipated behavioural consequences (Fishbein, 1963:132; Fishbein & Ajzen, 1975:78). The TRA model viewed A_o as an external variable, exerting influence over intention only through its effect on beliefs about the behaviours' consequences, evaluations of the consequences, normative beliefs, motivations to comply and importance weights (Fishbein & Ajzen, 1975:76; 1980:85).

Fishbein and Ajzen (1975:78) discuss two other important conditions under which the ability of the intention variable to predict behaviour can be reduced. Firstly, as the time between the measurement of a person's intention and the observation of their behaviour increases, the likelihood that their intention may change is also increased, thereby reducing the overall predictiveness of the original intention. Secondly, to the extent that the behavioural criterion is not under the actor's volitional control, their reduced ability to carry out their intention translates into reduced behavioural predictiveness. In this case, lack of volitional control may arise where the individual lacks the ability or resources to carry out an intended behaviour.

The TRA model again asserts that external variables, such as the characteristics of the behavioural target, may influence behavioural intentions only indirectly by influencing the individual's beliefs, evaluations, normative beliefs, motivation to comply, or the importance weights on the attitudinal and subjective norm, motivation to comply (Fishbein & Ajzen, 1975:248). Also, the external variables in the model encompass all variables not explicitly and this includes demographic or personality characteristics of the actor, the nature of the particular behaviour under consideration, characteristics of referent, prior behaviour, and persuasive communication.

There are attractive characteristics associated with the TRA model which will influence this research. For instance, a substantial body of empirical results has

accumulated which will generally provide support for the empirical results for the model specification (Ajzen & Fishbein, 1980:79; Fishbein & Ajzen, 1975:77; Ryan & Bonfield, 1975:487). This model has also been widely used in applied research spanning a variety of subject areas (Brinberg & Durand, 1983:144; Davidson & Morrison, 1983:231; Hom, Katerberg & Hulin, 1979:512; Jaccard & Davidson, 1972:525; Manstaed, Proffitt & Smart, 1983:421), while at the same time stimulating a great deal of theoretical research aimed at understanding the model's limitations, testing key assumptions, and analysing various refinements and extensions (Bagozzi, 1981:376, 1982:41, 1984:20; Bentler & Speckart, 1979:31; Ryan, 1982:461; Saltzer, 1981:212; Warshaw, 1980a,1980b; Warshaw & Davis, 1984:162,1985:332, in press; Warshaw, Sheppard & Hartwick, in press).

The model appears well suited to the research objectives where it provides a well-founded theory of the motivational linkages between external stimuli, of which system characteristics are an instance, and a resulting behaviour. Moreover, the model provides criteria for developing operational measures for observing these motivational phenomena prior to their behavioural manifestation. It is capable of integrating numerous theoretical perspectives from psychology which have previously been employed in management information system acceptance research. In addition, it may provide the opportunity to take advantage of new theoretical developments and extensions in the reference discipline as they become available.

TRA is effective in explaining behaviour when volitional control is high. It is effective when there is a high degree of perceived success or perceived and actual control over the internal and external factors that may interfere with an intended action. Ajzen elucidates the relationship by showing that TRA is relevant when the subjective probability of success or perceived and actual control over the behavioural goal is at its maximum. It is required to go beyond TRA when the possibility of actual control is limited (Ajzen, 1985:78; Ajzen, 1991:283; Ajzen & Fishbein, 1980:238; Fishbein & Middlestadt, 1989:253; Montano & Kasprzyk, 2002:32).

2.2.3 Diffusion of innovation (DOI)

DOI has been widely applied in research in disciplines such as education, sociology, communication, agriculture, marketing, and information technology (Rogers, 1995:257; Karahanna et al., 1999:189; Agarwal, Sambamurthy, & Stair, 2000:422). DOI has also been widely applied in explaining IT adoption behaviours (Chen et al., 2002:320; Hsu, Lu, & Hsu, 2007:241; Moore & Benbasat, 1991:202; Wang & Liao, 2008:209). DOI is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures (Al-Jabri & Sohail, 2012:320). As stated earlier in this chapter's introduction, the researcher propose to test these characteristics of innovation in the adoption of Internet banking in Ghana. Rogers (1983:163, 2003:47) used innovation diffusion theory (IDT) to explain the process of innovation adoption. The IDT theory which was founded on sociology has five different sets of variables (including variables for perceived characteristics of innovations and nature of social systems) which have been used to study a variety of innovations since the 1960s. Understanding how ideas and technologies diffuse or spread among people has been studied in many fields. Most of these technologies are designed to improve the lives of their intended users or bring about benefits for the users, but this can occur only when these technologies are adopted.

Rogers (1983:11) defines the concept of innovation as "any idea, object, technology, or a practice that is new". These can be either tangible or intangible. Tangible innovation includes physical objects such as a new device or medicine, while intangible innovations can include new design methodology or pedagogical technique. Furthermore, the notion of an innovation's newness can be relative to both place and population. For instance, an innovation may be a cutting edge communication technology among Silicon Valley businessmen. However, a well-established technology practice such as the use of antibiotics, may be new in a developing country but is no longer new for the more advanced countries. Ghana is currently experiencing new innovations such as SMS banking, Internet banking and

visa card usage, whereas these are the everyday norm in advanced countries such as the United States, United Kingdom and Germany.

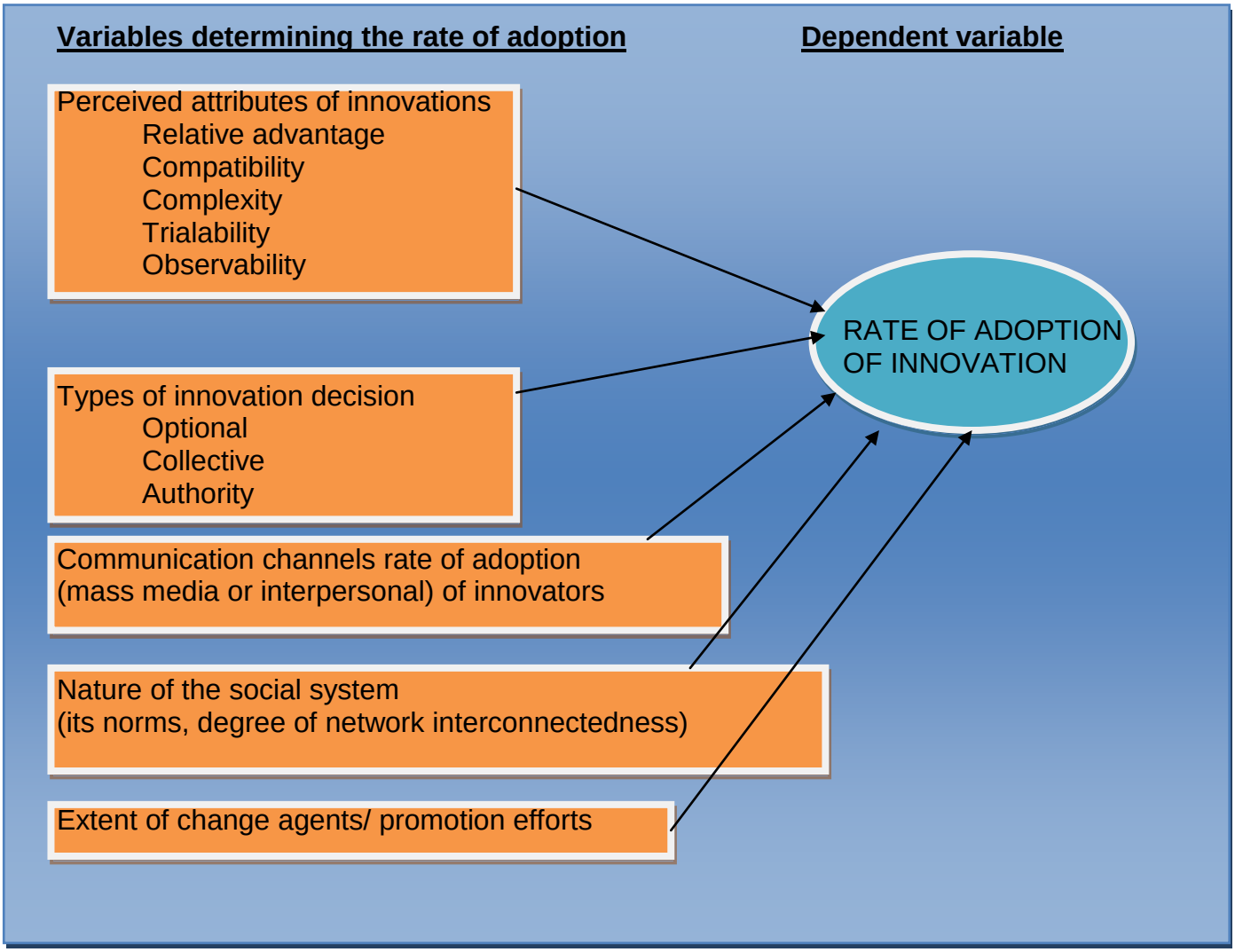
Diffusion is defined by Rogers (1983:5) as “the process by which an innovation is communicated through certain channels over time among the members of a social system”. The consequence of a diffusion process results in the acceptance or penetration of a new idea, behaviour, or physical innovation. It is a special type of communication, in that the messages are concerned with new ideas. He further defined communication as a “process in which participants create and share information with one another in order to reach a mutual understanding”. This definition is supported by Rogers and Kincaid (1981:104), who propose that communication is a two-way process of convergence rather than a one-way, linear act in which an individual seeks to transfer a message to another. Therefore, diffusion is said to be a special type of communication, in which the messages are concerned with new ideas. It is the newness of the idea in the message content of communication that gives diffusion its special character. Also, the newness means that some degree of uncertainty is involved.

Rogers (1983:6) further stresses that diffusion brings about a kind of social change where alteration occurs in the structure and function of a social system. For instance, when new ideas are invented, diffused and are then adopted or rejected, leading to certain consequences, social change is also occurring. Therefore, according to Agarwal, (2000:90) innovation diffusion theory argues that “potential users make decisions to adopt or reject an innovation based on beliefs that they form about the innovation”. This is due to the fact some cultures and societies are predisposed to using innovations.

Rogers (1983:221) proposes some variables used in determining the rate of diffusion of innovation, namely perceived attributes of innovation, type of innovation decision, communication channels used for the adoption, nature of the social system as well

as the extent of change agents facilitating the adoption of innovation. The interplay of these variables is illustrated in Figure 2.3.

Figure 2.3: Determinants of the rate of DOI



Source: Rogers (1983)

The perceived attributes of innovation in the diffusion theory by Rogers (1983:112) that consistently influenced the adoption of innovations is supported by other researchers such as Holloway (1977:14); and Tornatzky and Klein (1982:31). The usefulness of the attributes is mainly to predict their future rate of adoption. Rogers

identifies several attributes of an innovation that are key influences on adoption behaviour. These attributes are relative advantage, complexity, compatibility, trialability, and observability. A number of previous studies (Koenig-Lewis et al., 2010:153; Liu & Li 2010:312; Papies & Clement 2008:328; Park & Chen 2007:350; Vijayasarathy 2004:300) have examined these factors in adoption and diffusion of Internet-based technologies and have consistently identified these attributes, particularly those of relative advantage, ease of use, and compatibility, as the most frequently salient factors for adoption of Internet and mobile technologies. These attributes are discussed below.

2.2.3.1 Relative advantage

This is said to be the degree to which an innovation is perceived as being better than the idea it supersedes or than its predecessor and this is usually expressed in terms of economic profitability, status, and in other ways (Rogers, 1983:213; Moore & Benbasat, 1991:198). An innovation should displace a former one in content and context. McCloskey (2006:201) and Rogers (2003:157) propose that when users perceive relative advantage or usefulness of a new technology over an old one, they tend to adopt it. The nature of the innovation largely determines what specific type of relative advantage is important to adopters (such as economic, social status, the degree of economic profitability, low initial cost, a decrease in discomfort, a savings in time and effort, and the immediacy of the reward), although the characteristics of the potential adopters affect which dimensions of relative advantage are most important. Lin (2011:229) identifies benefits such as immediacy, convenience and affordability to customers as factors that influence mobile banking adoption.

Griliches (1957:975) in Rogers (1983:215) argues that economic gains are more important in the adoption process than any other factor. However, this argument has been refuted by other researchers (Brandner & Straus, 1959:327; Brandner, 1960:320; Brandner & Kearl, 196:42; Havens & Rogers, 1961b; Griliches, 1962:348; Rogers & Havens, 1962b; Dixon, 1980:390) who are of the opinion that compatibility

and observability are complements of, not substitutes for, relative advantage. Van der Haak (1972:460) also endorses this assertion in stating that status motivations for adoption seem to be more important for innovators, early adopters, and early majority, and less important for the late majority and laggards.

Rogers (1983:219) concludes that relative advantage of an innovation, as perceived by members of a social system, is positively related to its rate of adoption. In summary, when customers perceive distinct advantages offered by an innovation, they are more likely to adopt it.

2.2.3.2 Compatibility

Hernandez and Mazzon (2007:124); Rogers (1983:223) and Chen et al. (2004:83) define compatibility as the "degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters". Ndubisi and Sinti in their (2006:304) research in Malaysia have shown that compatibility is a noteworthy precursor in determining consumers' attitude towards Internet banking adoption. Rogers (1983:226) further asserts that an innovation can be compatible or incompatible with the following: (1) socio-cultural values and beliefs, (2) previous introduced ideas, (3) client desires for innovations.

Hawley (1946:769) suggests that if the innovation is incompatible with one's cultural values, it leads to a blockage of its adoption, and that an idea that is more compatible is less uncertain to the potential adopter. Also, change agents usually face an uphill task in promoting innovations that run counter to strongly held values. Fals and Borda, (1960:228) find that adopters are also comfortable with a preceding idea which can either speed up or retard its rate of adoption. This is because old ideas are the main tools with which new ideas can be assessed. Therefore, previous practices are standards against which the innovation can be interpreted, thereby leading to a decrease in uncertainty about the innovation. The rate of adoption of a new idea is affected by the old idea that it supersedes (Rogers, 1983:226).

Rogers (1983:229) further states that some clients may not recognise the need for an innovation until they become aware of the new idea. It is therefore important for change agents to generate needs among their clients. This must however be done carefully, or else the felt needs upon which diffusion campaigns are based may be only a reflection of the change agent's needs, rather than those of his or her clients. Therefore, “compatibility of an innovation, as perceived by members of a social system, is positively related to its rate of adoption” (Rogers (1983:221).

2.2.3.3 Complexity

Complexity as defined by Rogers (1983:230), is the degree to which an innovation is perceived as relatively difficult to understand and use. Some scholars (Gu et al., 2009:89; Luarn & Lin, 2005:901; Venkatesh & Davis, 2000:206a; Wang et al., 2006:321) suggest that there is a strong impact of PEOU of new technology on its adoption. This was supported by other researchers such as Kivlin (1960:231), Singh (1966:349) and Petrini (1966:322) who were all of the opinion that some innovations are clear in their meaning for potential adopters and are easier to adopt, while others are not.

A significant sum of research exists (Au & Kauffman 2008:540; Mallat 2007:209; Ondrus & Pigneur 2006:320) on mobile technology to suggest that users’ intention to adopt mobile banking is inhibited by the perceived complexity of the innovation. According to Vrechoupoulos et al. (2003:390), complexity in use such as technical infrastructure and design of technology, are reported as being individual barriers in the adoption of an innovation. Rogers, (y1983:231) concludes that the “complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption”. Hence complexity negatively influences the adoption of innovation.

2.2.3.4 Trialability

Trialability refers to the extent to which the innovation can be experienced before its actual adoption (Hernandez & Mazzon, 2007:312). It also refers to the degree of risk

in using an innovation (Ram & Sheth, 1989:819). Innovations that can be pre-tested are more easily adopted or accepted than those that cannot be pre-tested. Literature (Agarwal & Prasad, 1997:212; Rogers, 2003:237) suggests that potential adopters who are allowed to try out an innovation will feel more comfortable with it and are more likely to adopt it. It is argued that if customers are given a chance to try the innovation, it will minimise certain unknown fears, and lead to adoption. Perceptions of risk by customers usually happen as a result of the doubt related to the degree of inconsistency between customers' judgment and real behaviour, and technology failing to deliver its anticipated outcome and its consequent loss (Chen, 2008:401; Koenig-Lewis, Palmer & Moll 2010:210; Lee et al., 2007:58).

Comparatively early adopters perceive trialability as more important than later adopters. Gross (1942:982) and Ryan (1948:31) observed that the early innovative individuals have no precedent to follow when they adopt, while later adopters are surrounded by peers who have already adopted the innovation and that these peers act as a psychological trial for the later adopters. Hence, the actual trial of a new idea is of less significance for them. Rogers (1983:231) again concludes that "the trialability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption".

2.2.3.5 Observability

Observability is said to be the "degree to which the results of an innovation are visible to others" (Rogers 1983:232). Here, the outcomes of the innovation are easily observed and communicated to others, whereas some innovations are difficult to describe to others. Moore and Benbasat (1991:191) simplified the original construct by redefining observability into visibility and result demonstrability. Rogers (1983:231) states that "the observability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption". With the exception of the complexity construct, each of the remaining four constructs (relative advantage,

compatibility, observability and trialability) has a positive relationship with intention to adopt an innovation.

Proposing to measure the initial adoption and diffusion of information technology innovations within groups, Moore and Benbasat (1991:192) added two constructs to the five attributes that Rogers (1983:231) originally modelled. These were (1) image – explained as the extent to which an innovation is perceived to improve the status of an individual in a given social system, and (2) voluntariness of use – defined as the extent to which the use of an innovation is perceived as a free will act. These additions were based on the work of Tornatzky and Klein (1982:13) which argued for the separation of the image construct from the relative advantage because of its importance to innovation adoption gathered from earlier studies.

Moore and Benbasat (1991:190), reinforcing the Tornatzky and Klein (1982:16) argument, explain that the definition given to relative advantage in the model puts the emphasis on the perception that people have of the innovation itself, which is different from the perception someone has of a person actually using the innovation in question. Thus for Moore and Benbasat (1991:195) the key to innovation diffusion lies in the positive perception of the status (image) that one is perceived to acquire by using the innovation. For the voluntariness of use construct, Moore and Benbasat (1991:195) reason that whether individuals are free or not free to adopt or reject an innovation, must be considered. The freer an individual is to adopt or the greater the pressure on an individual to reject an innovation, the higher the odds that these innovation or technology will be adopted or rejected accordingly.

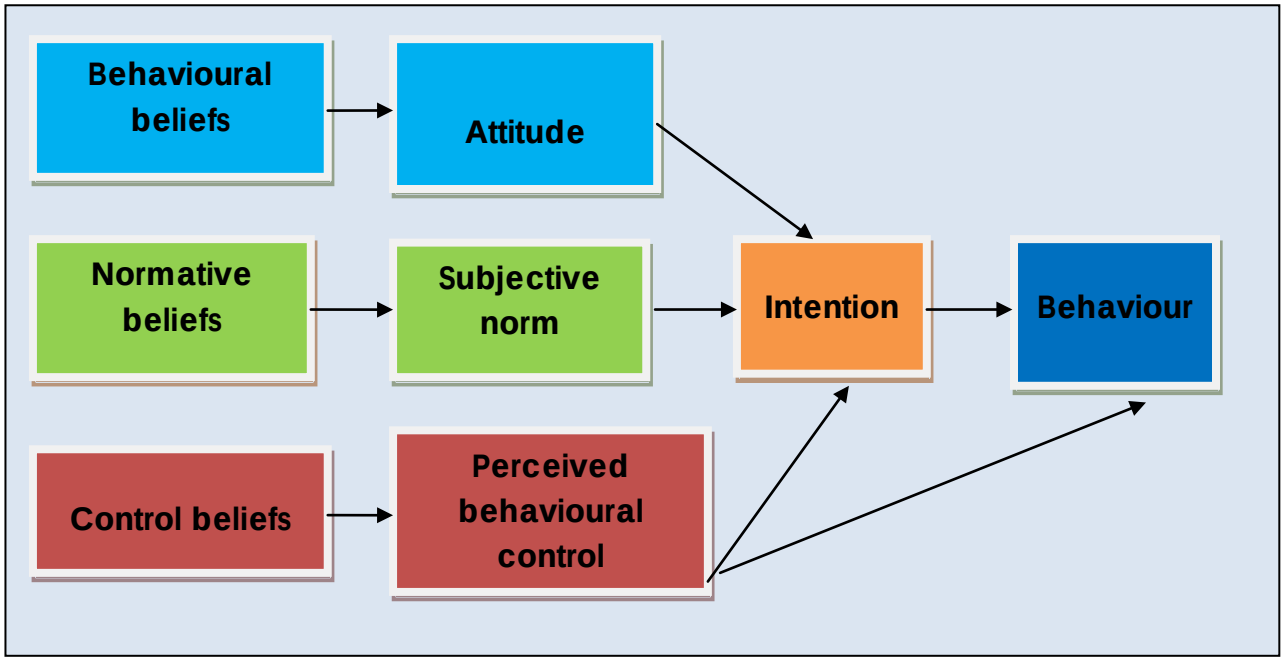
2.2.4 Theory of planned behaviour (TPB)

TPB is essentially an extension of TRA that includes measures of control belief and PBC. The fundamental basis of this model was to develop integrated models of behaviour, including additional determinants of behaviour such as social norms or intentions (Olson & Zanna, 1993:201). TPB predicts human behaviour based on

recognised relationships between attitudes, norms, beliefs (perceived behavioural control), behavioural intentions and usage behaviour. The central objective of TPB is to predict behaviour and understand its causes (Armitage & Christian, 2003:132). Some individual studies and meta-analytic reviews (Armitage & Conner, 2001:120; Hagger, Chatzisarantis & Biddle, 2002:438) conducted in several domains have supported the tenets of the TPB.

According to Ajzen (1991:83), one's attitude towards behaviour, coupled with prevailing subjective norms, and with perceptions of behavioural control factors, all serve to influence an individual's intention to perform a given behaviour. The theory emphasises that behaviour, in the case of technology usage, is a direct function of intention to use that technology and perceived behavioural control, and that the intention to use the technology is jointly influenced by one's attitude, subjective norm, and perceived behavioural control. Other studies (Mathieson, 1991:913; Taylor & Todd, 1995:89) have demonstrated strong empirical support for TPB, explaining technology adoption behaviour in both individual and organisational settings. Rawstorne et al., (2000:160) stress that TPB explains technology usage behaviour in settings where individuals do not have complete control over their behaviour, such as in an organisational setting where workers are required to use a variety of information technologies in the performance of their work duties. The relationship between behaviour and attitude as depicted by Armitage and Conner (1999:421a) is illustrated in Figure 2.4 below.

Figure 2.4: Framework of TPB



Source: Armitage and Conner (1999)

Ajzen (1991:84) extended TRA to include a measure of perceived behavioural control which is a variable that had received a great deal of attention in social cognition models designed to predict health behaviours (Armitage & Conner, 2000:540; Conner & Norman, 1996:158). In Figure 2.4 above, PBC is held to influence both intention and behaviour. Armitage and Conner (2001:340) support this view and state that the underlying principle behind the addition of PBC is to allow prediction of behaviours which are not under complete volitional control. Therefore, although TRA could adequately predict behaviours that were relatively straightforward (under volitional control), in other circumstances where there were constraints on action, the mere formation of an intention was found to be insufficient to predict behaviour. Therefore, the inclusion of PBC provided additional information about the potential constraints on action as perceived by the actor, and is held to explain why intentions do not always predict behaviour. TPB postulates three conceptually independent determinants of behavioural intention, which are used in this study to examine the

use of Internet banking adoption in Ghana. These determinants of intention are attitude towards behaviour, subjective norm and PBC (Ajzen, 1991:81).

Ajzen (1991:81) states that “the relative importance of attitude, subjective norm, and PBC in the prediction of intention vary across behaviours and situations”. That is, in situations where attitudes are strong, or where normative influences are powerful, PBC may be less predictive of intentions. Thus, Ajzen (1991:82) argues that the magnitude of the PBC–intention relationship is dependent upon the type of behaviour and the nature of the situation (Sparks, Hedderley & Shepherd, 1992:761) and that individual differences in sociability (Tramow & Finlay, 1996:329) increase the relative predictive power of attitudes and subjective norms, respectively. In general, individuals are more willing to engage in behaviours that are believed to be achievable (Bandura, 1997:231). PBC is also held to exert both direct and interactive effects (meaning those with behavioural intentions) on behaviour. This is based on the following rationale: however strongly held, the implementation of an intention into action is at least partially determined by personal and environmental barriers. “The addition of perceived behavioural control should become increasingly useful as volitional control over behaviour decreases” (Ajzen, 1991:82).

Therefore, in situations where prediction of behaviour from intention is likely to be hindered by the level of actual volitional control, PBC should (1) facilitate the implementation of behavioural intentions into action, and (2) predict behaviour directly. In the prediction of social behaviours, there are no absolutes. However, it is instructive to consider Ajzen’s (1991:83) predictions by examining the impact of PBC on behaviour under both optimal and suboptimal conditions; in other words, in conditions of complete volitional control and where there are problems of volitional control. In optimal conditions, the intention–behaviour relationship should be optimal, and PBC should not exert any influence on this relationship. By contrast, where the behaviour is not under complete volitional control, PBC should moderate the relationship between intention and behaviour (Baron & Kenny, 1986:427). Under

such conditions, greater PBC should be associated with stronger intention–behaviour relationships.

In earlier versions of TPB, Ajzen (1985:889) emphasised the fact that the interaction between behavioural intention and PBC should be independently predictive of behaviour. That is, under conditions where volitional control is relatively low (where intention is only weakly related to behaviour), increased PBC should facilitate the implementation of intentions into action. However, Ajzen (1991:83) reported that only one study had found the (marginally) significant (p<.10) intention–PBC interaction that would support this moderator hypothesis. Ajzen (1991:88) argued that this finding reflected the fact that linear models account well for psychological data even if interaction terms are known to be present. In several more recent studies (Terry & O'Leary, 1995:782), significant PBC–intention interactions have been found to test the TPB model.

Ajzen (1991:92) maintains that under conditions where behavioural intention alone would account for only small amounts of the variance in behaviour (conditions where there are problems of volitional control), PBC should be independently predictive of behaviour. This is based on the rationale that increased feelings of control will increase the extent to which individuals are willing to exert additional effort in order to successfully perform a particular behaviour. In contrast, under conditions of very high volitional control, behavioural intention should be the only predictor of behaviour. This ceiling effect occurs because where the behaviour is relatively straightforward, exerting additional effort to engage in the behaviour will not impact on the actual performance of the behaviour, over and above the effects of intention. However, predictions concerning the effects of PBC on behaviour are clouded by the explicit assumption that PBC is an accurate representation of actual (volitional) control. Indeed, Ajzen (1991:91) states that "when PBC is inaccurate, all kinds of possibilities open up". Thus, where PBC and actual control are discrepant, the effect of PBC on behaviour is more problematic.

Critics (Hardeman et al., 2002:261; Taylor et al., 2007:148; Webb et al., 2010:412) argue that TPB cannot be considered useful or effective in relation to planning and designing the type of intervention that will result in behaviour change. Langer (1975:320) and Lerner (1977:689) found that PBC would rarely reflect actual control in a very accurate way. This stems from the fact that adequate tests of predictions concerning the effects of PBC on behaviour would either (1) experimentally manipulate individuals' levels of perceived control, or (2) obtain independent measures of volition (actual control). As noted earlier, within the TPB, PBC is held to affect both intentions and behaviour. Ajzen (1991:89) proposes two further antecedents of intention, namely subjective norm and attitude toward the behaviour, which are retained from the earlier TRA. Subjective norm refers to the "individual's perceptions of general social pressure to perform (or not to perform) the behaviour". Here, if an individual perceives that significantly, others endorse (or disapprove of) the behaviour, they are more (or less) likely to intend to perform it. Therefore, attitude towards the behaviour reflects the individual's global positive or negative evaluations of performing a particular behaviour.

In general, the more favourable the attitude towards the behaviour, the stronger will be the individual's intention to perform it (Ajzen, 1991:89). This author laments that the antecedents of attitude, subjective norm and PBC are corresponding beliefs that reflect the underlying cognitive structure. Each behavioural belief links a given behaviour to a certain outcome, or to some other attribute, such as the cost incurred in performing the behaviour. Again, the attitude towards the behaviour is determined by the strength of these associations, and by the beliefs that are salient at the time.

Based on the work of Fishbein and Ajzen (1975:79), the subjective value of a given outcome affects the attitude in direct proportion to the strength of the belief. Subjective norm is considered to be a function of salient normative beliefs. While subjective norm relates to perceptions of general social pressure, the underlying normative beliefs are concerned with the likelihood that specific individuals or groups

with whom the individual is motivated to comply, will approve or disapprove of the behaviour. According to Ajzen (1991:92), control beliefs are the antecedents of PBC, and are concerned with the perceived power of specific factors to facilitate or inhibit performance of the behaviour. Like other beliefs, TPB takes account of the relevance of the belief to the individual, by taking a measure of the frequency of occurrence of the promoting (or inhibitory) factor. Other researchers have provided support for the TPB model (Blue, 1995:54; Conner & Sparks, 1996:124; Godin, 1993:93; Jonas & Doll, 1996:123; Manstead & Parker, 1995:321; Sparks, 1994:194; Ajzen, 1991:88; Godin & Kok, 1996:48; Hausenblas, Carron, & Mack, 1997:389; Van den Putte, 1991:17).

In conclusion, TPB theorises that the more favourable the attitude and subjective norm, and the better the perceived control, the stronger should the person's intention to perform a behaviour.

2.2.5 Decomposed theory of planned behaviour (DTPB)

Taylor and Todd (1995:89) propose this model, which is based on the TPB (Ajzen, 1985:239) and the IDT (Rogers, 1983). Although the TPB has good explanatory power for predicting and understanding future behaviour, it also suffers some practical and theoretical disadvantages (Taylor & Todd 1995:89). In particular, it combines cognitive belief structures into one-dimensional constructs (attitudes, subjective norms and PBC), which prevents any determination of the relative importance of each cognitive belief (Cauberghe & Pelsmacker, 2011:203).

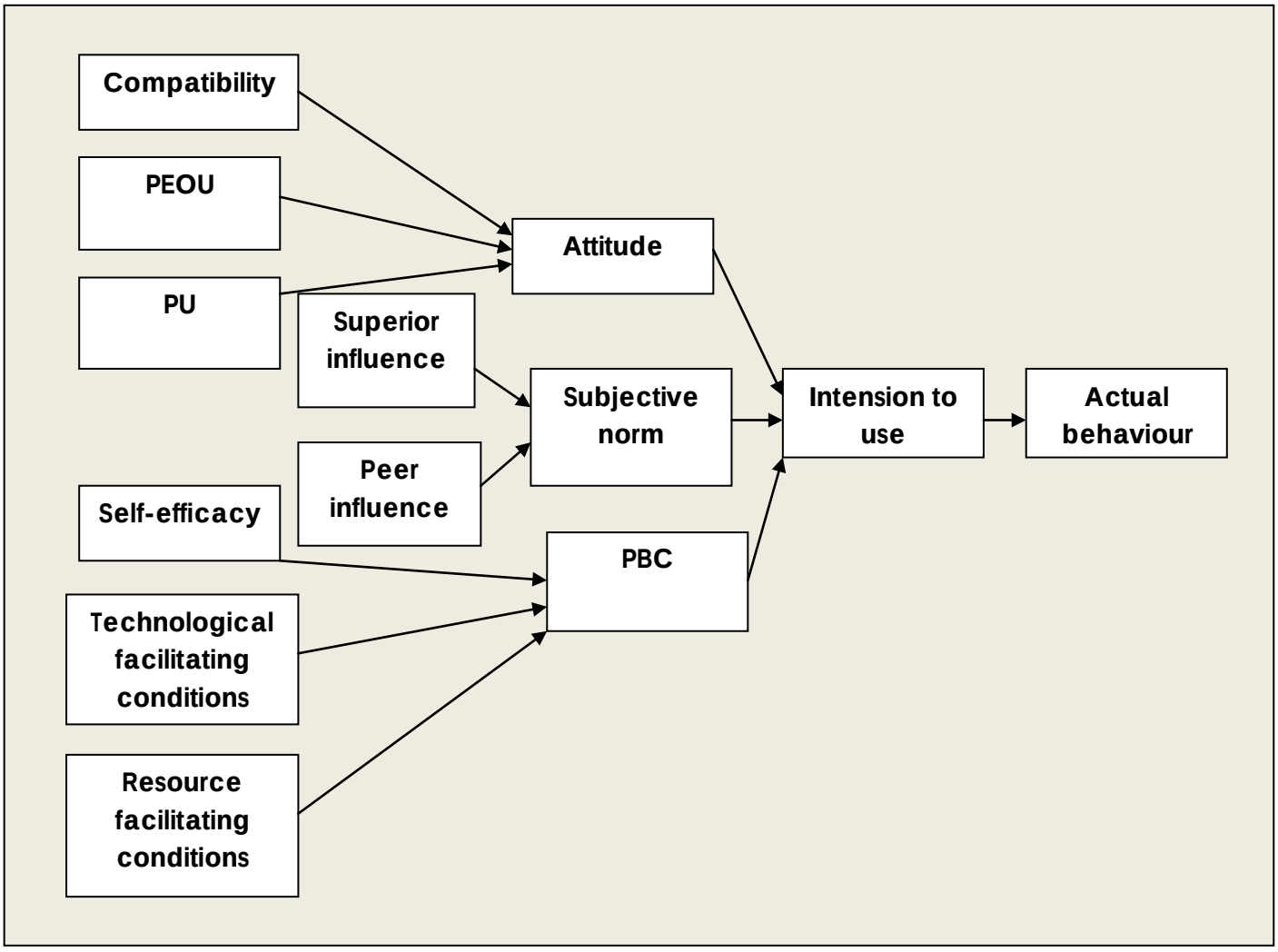
Taylor and Todd (1995:89) found that the DTPB is superior to the TPB and TAM in understanding behavioural intention to use IT. While the TPB simply explains the relationship between structure of beliefs and the prerequisite of intention, in brief, DTPB offers a comprehensive approach to understanding the factors affecting a person's decision to use technology information (Suoranta and Mattila, 2004:173). It has the advantage of incorporating many additional factors than the traditional TPB

or even TAM model does. It also provides an increased explanatory power and an understanding of its constructs (Pedersen, 2005:143).

Using the TPB as its basis, the DTPB decomposes attitude towards use by incorporating (1) PEOU, (2) PU, and (3) compatibility, which serve as antecedents of attitude towards use (Lin, 2007:79; Taylor & Todd, 1995:90; Moore & Benbasat 1991:198; Torznatzky & Fleischer, 1990:13). PEOU is "the degree to which a person believes that using the system will be effortless" (Davis 1989:320), and PU is "the degree to which a person believes that using a particular technology will enhance his/her job performance" (Plouffe, Hulland & Vandenbosch, 2001:212). Compatibility refers to the degree to which the innovation fits with the potential adopter's existing values, previous experiences, and current needs (Rogers,:(1995:225). By means of the DTPB, several previous studies (Hung & Chang, 2005; Huang & Chuang, 2007) have decomposed PBC into multidimensional belief constructs.

The DTPB model consists of three main factors influencing behavioural intention and actual behaviour (adoption) which are attitude, subjective norms and PBC. According to Taylor and Todd (1995:90), DTPB offers the advantage of easy applicability to a variety of situations (Bagozzi, 1981:543; Shimp & Kavas,1984:745) and in managerial terms, DTPB is more relevant to the determination of specific factors that lead to adoption and use of technology (Hernandez & Mazzon, 2006:184). The DTPB achieves this by decomposing more completely the three main factors that influence intention into more specific dimensions (Tan & Teo, 2000:378).

Figure 2.5: DTPB



Source: Taylor and Todd (1995)

The first area of decomposition takes into account attitudinal belief structures (Taylor & Todd, 1995:146). Identification of stable sets of relevant beliefs dimensions for attitudinal beliefs in the TRA and TPB models are problematic (Berger, 1993). Additionally, the associated difficulties with regard to salient beliefs may be one of the reasons Davies et al. (1989:998) and Mathieson (1991:876) found that TRA and TPB did not explain usage intentions as well as TAM did. This is because the measure of ease of use and usefulness in TAM were based on well developed, refined and validated measures (Davis, 1989:341). However, the beliefs measurement in TRA

and TPB were based on a salient beliefs elicitation measure which develops a scale peculiar to a specific setting. Therefore, measuring beliefs may be less than ideal in this case. Taylor and Todd (1995:142) therefore derived a set of attitudinal beliefs dimension from the variables in the perceived characteristics of innovation diffusion (Rogers, 1983), namely relative advantage, complexity and compatibility and found them to be consistently related to adoption decisions (Tornatzky & Klein, 1982:133) and IT usage (Moore & Benbasat, 1993:202). Taylor and Todd (1995:146) conclude that as perceived relative advantage and compatibility of IT usage increases, complexity decreases, resulting in a positive attitude towards IS usage. This outcome is corroborated by Hoffer and Alexander (1992:543), Davies (1989:341), Davies et al. (1989:998), Mathieson (1991:675), and Moore and Benbasat (1993:199).

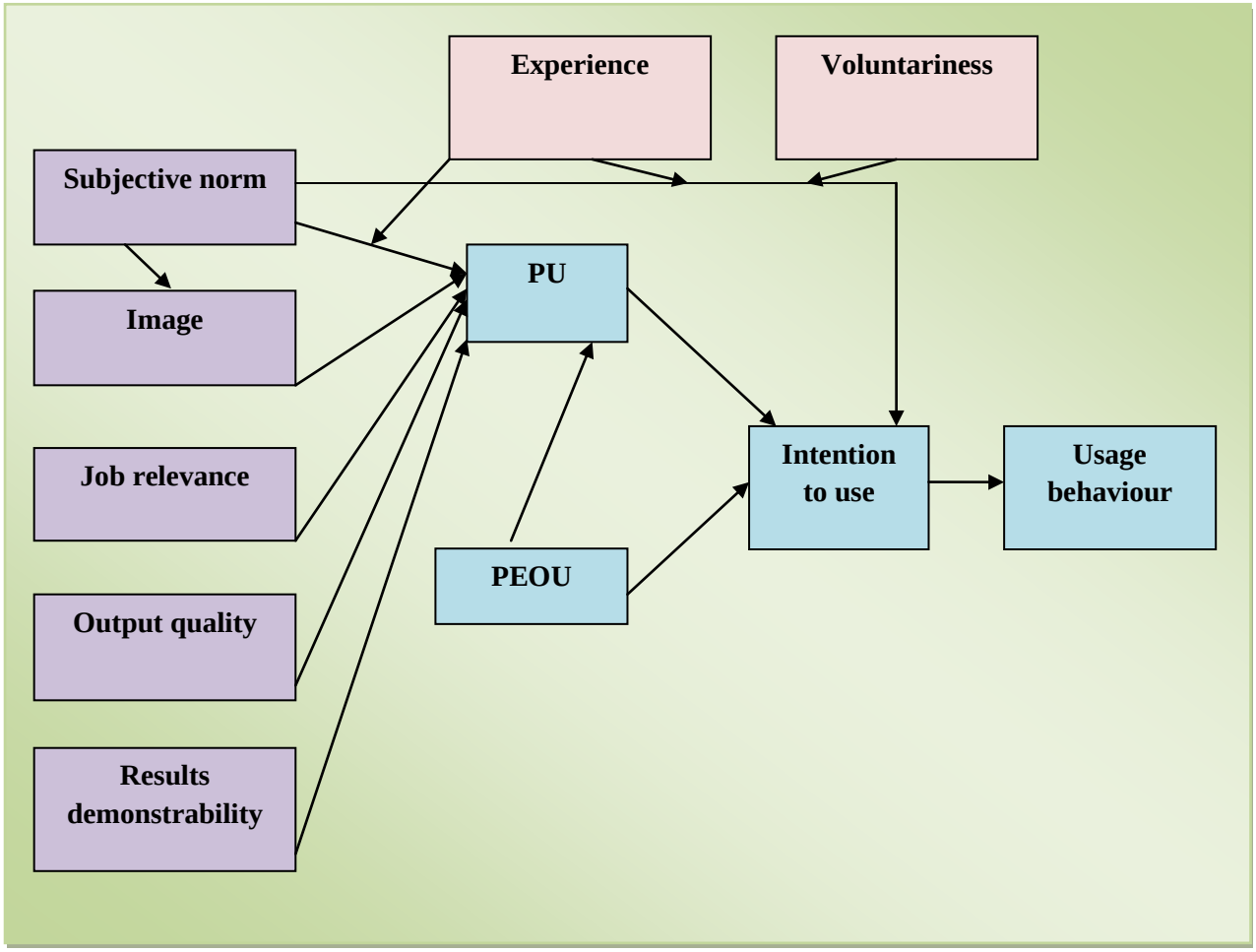
The second decomposition by Taylor and Todd (1995:90) involves the normative believes structures into different segments or groups (Burnkrant & Page, 1988:128; Shimp & Kavas, 1984:734; Oliver & Bearden, 1985:465). This is as a result of the different opinion that each cluster or group may hold in an organisation towards acceptance of technology usage. Different groups or segments react differently to the adoption of a technology based on their belief structures.

The third and last aspect of decomposition by Taylor and Todd (1995:97) involves the control belief structures proposed by Ajzen (1985:89; 1991:201) who refers to the internal notion of the individual described as self-efficacy (Bandura, 1997:256) and to external resources constraints such as time and money as well as other relating technology compatibility issues. Taylor and Todd (1995:96) argue that the absence of facilitating resources represents barriers to usage and may inhibit the formation of intention and usage of technology. As affirmed by Ajzen (2005:87), as a general rule, “people intend to perform a behaviour when they evaluate it positively, when they experience social pressure to perform it, and when they believe that they have the means and opportunities to do so.”

2.2.6 Extension of technology acceptance model (TAM 2)

TAM is a robust but parsimonious theory and it is useful to explain a particular IS or technology (Chen, Li, & Li, 2011:223). For this reason, many studies proposed extended models for revising TAM. PU in the original TAM was consistently a strong determinant and a fundamental driver of usage intentions. PEOU on the other hand had exhibited a less consistent effect on intention across studies. Whereas some research (Venkatesh & Davis, 1996:452) had been done to model the determinants of PEOU, the determinants of PU had been comparatively ignored. A better understanding of the determinants of PU was necessary to help in designing organisational interventions that would increase user acceptance and usage of new systems (Venkatesh & Davis, 2000a:193). Venkatesh and Davis (1996:457) therefore extended TAM to include additional key determinants of TAM's PU and usage intention constructs, in order to understand how the effects of these determinants change with increasing user experience over time with the targeted system. Using TAM as the starting point, the extension is referred to as TAM2. TAM2 incorporates additional theoretical constructs spanning social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability and PEOU) as illustrated below. These additions look at constraining issues that an individual faces at an opportunity to adopt or reject a new system.

Figure 2.6: Extension of TAM (TAM 2)



Source: Venkatesh and Davis (2000a; pp 188)

Subjective norm as defined by Fishbein and Ajzen (1975:83) is a "person's perception that most people who are important to him think he should or should not perform the behaviour in question". This was integrated as an express determinant of behavioural intention in TRA (Fishbein & Ajzen, 1975:84) and subsequently in TPB (Ajzen, 1991:82). The underlying principle of subjective norm on intention according to Venkatesh and Davis (2000a:187) was that people may choose to execute activities, even if they themselves are not interested in the behaviour or its consequences, but if they believe that one or more important references think they

should, they are sufficiently motivated to comply with the referents. The direct effect of subjective norm on intention has however generated mixed results. Whereas Mathieson (1991:913) found no significant effect of subjective norm on intention, Taylor and Todd (1995:90) did find a significant effect. Davis et al. (1989:999) acknowledge the need for additional research to “investigate the conditions and mechanisms governing the impact of social influences on usage behaviour”.

Voluntariness and compliance with social influence is “the extents to which potential adopters perceive the adoption decision to be non-mandatory” (Agarwal & Prasad, 1997:423; Hartwick & Barki, 1994:291; Moore & Benbasat, 1991:195). Hartwick and Barki (1994:292) also argue that even when users perceive system use to be organisationally mandated, its usage intentions vary since some users are reluctant to comply with such directives. They found that subjective norm had a significant effect on intention in mandatory settings, but not in voluntary settings and referred to the causal mechanism underlying this effect as compliance. They state that in a computer usage context, the direct compliance-based effect of subjective norm on intention over and above PU and PEOU will occur in mandatory, but not voluntary, system usage settings.

According to Venkatesh and Davis (2000a:187), TAM2 theorises that internalisation, unlike compliance, will occur whether the context of system use is voluntary or mandatory. That is, even when system use is organisationally mandated, users’ perceptions about usefulness may still increase in response to persuasive social information.

Venkatesh and Davis (2000a:187) observe that individuals usually react to social normative influences to create or sustain a good image within a reference group. Moore and Benbasat, (1991:192) define image as “the degree to which use of an innovation is perceived to enhance one’s status in one’s social system.” Venkatesh and Davis, (2000:187) are of the view that subjective norm will positively influence image due to the fact that, if influential members of a person’s social group at work

believe that he or she should perform a behaviour (such as using a system), then performing it will tend to elevate his or her standing within the group (Blau, 1964:211; Kiesler & Kiesler, 1969:76).

Venkatesh and Davis (2000a:190) define job relevance as an “individual’s perception regarding the degree to which the target system is applicable to his or her job”. Kieras and Polson (1985:121) and Polson (1987:267) argue that users possess distinct knowledge about their job situations, which they can use as a basis for determining what tasks can be performed with a given system. The existence of well-defined knowledge structures regarding important job goals is supported by research from personnel psychology (Roberson, 1989). Venkatesh and Davis (2000a:191) conceptualise perceptions of job relevance to be part of a compatibility test within the context of Beach and Mitchell’s (1996:476; 1998:988) image theory, given that systems below a minimal threshold value of perceived job relevance would be screened from further adoption consideration.

On the basis of output quality, Venkatesh and Davis, (2000a:190) find that irrespective of what tasks a system is capable of performing and the degree to which those tasks match their job goals (job relevance), people will take into consideration how well the system performs those tasks. Davis et al.,(1992:992) support this position and develop a relationship between perceived output quality and PU, indicating that one would be inclined to choose a system that delivers the highest output quality. Beach and Mitchell (1996:476; 1998:988) lament that job relevance is more apt to take the form of a compatibility test whereby systems that are judged not to be job-relevant are eliminated from one’s choice set for further consideration. Adoption therefore will centre on how the technology helps to achieve goals set for the job.

Moore and Benbasat (1991:210) define result demonstrability as the “tangibility of the results of using an innovation”. From this definition, Venkatesh and Davis (2000a:192) posit that result demonstrability will directly influence PU and therefore

individuals are likely to form more positive perceptions of the usefulness of a system if the disparity between usage and positive results is readily determined. Technology usage must produce tangible results to be deemed useful. The last element of TAM2 retains PEOU from the original TAM as a direct determinant of PU (Davis et al., 1989:1003), where it argues that at an equilibrium, the less easier a system is to use, the more using it can increase job performance.

In conclusion, the proposed TAM2 encompasses social influence processes and cognitive instrumental processes as determinants of PU and usage intentions. Based on the above, Venkatesh and Davis (2000a:191) postulate that a decrease in the potency with which social influence processes influence PU and intention to use with increasing experience over time.

2.3 SUMMARY

This chapter placed the various theories discussed above into perspective. The definition, importance and role of each variable was highlighted. The various drawbacks and criticisms of theories were also identified, and a distinction was made between each theory and how much each influences the adoption of new technology, especially in the case of Internet banking. The dimensions of the relationships and the construct to be used by firms to measure their adoption efforts, were discussed, and the section concluded with possible strategies for technology adoption. The distinction between intention to use and actual usage was also discussed in detail together with the associated overriding advantages. The literature section of this chapter concluded with a discussion of social influence processes and cognitive instrumental processes as determinants of PU and usage intentions.

As stated in Chapter One, the purpose of this study is to identify the various variables that influence the adoption of Internet banking in Ghana from both the customer's and the bank's perspective. The empirical investigation will also be carried out from

both perspectives. Therefore, the business environment in Ghana coupled with adoption issues, as well as factors that managers of the banks consider before making decisions with regard to deploying Internet banking for use by their customers, will be discussed in the next chapter.

CHAPTER THREE
INTERNET BANKING CONCEPT IN GHANA

3.1 INTRODUCTION

Having discussed the various theories underpinning the adoption and diffusion of new technologies in Chapter Two, it is now important to focus attention on the technology environment in Ghana and how this can impact on the adoption of Internet banking by Ghanaian banks. This chapter will initially provide a general overview of the Internet banking concept and how it impacts on the customer.

The chapter will then address two secondary research objectives, namely to execute a secondary study on the Ghanaian banking industry and to investigate the various factors that bank managers consider before deploying Internet banking technology for its customers. A literature overview will be provided relating to the Ghanaian banking environment and the importance of technology for use by its customers will also be investigated.

3.2 CONCEPT OF INTERNET BANKING

The development and the increasing progress that is being experienced in ICT has brought about many changes in almost all facets of life – the banking sector is no exception. The banking sector transition is affected by the developments in ICT more than any other financial provider group (Chavan, 2013:21). Many developing countries' economies are dominated by physical monetary transactions which involves the exchange of bank notes and coins for the purchase of goods and services, are now giving way to a modern and sophisticated payment systems where currency and notes are converted to data, which is in turn transmitted through telephone lines and satellite transponders. This has accounted for rapid technological

progress and development in the financial market (Ozuru et al., 2010:13; Johnson, 2005:69). Concerning the increasing innovation and urgent need of up-to-date, convenient and reliable data, IS have gained high importance in the organisational context.

Against this background, organisations are benefiting from the advancement of new technologies and adapting to the new ways of communication with their clients. Therefore the banking and financial service providers are taking advantage of this new phenomenon to enhance the performance of their business activities and to sell various products (both old and new), but also to make available its core services to their customers (Jayawardhena & Foley, 2000:39). Tan & Teo, (2000:144) indicated that the dematerialisation of customer relationships (referring to the improved use of the numerous new information system available on the market) is a new problem that the banking and financial service providers are confronted with in the financial service sector. Overcoming these shortcomings will enable the clients to be assured of the use of this new transactions medium where majority of all their banking needs will be conducted with minimal human intervention.

New technologies coupled with the strive for globalisation by various businesses including the banking and financial service providers possess numerous tangible advantages. Among the benefits include the ability of the banks to initiate new channels to gain competitive advantage, improvement in the delivery of financial services, cost reduction, broader customer databases, progress on their financial positions through innovative products as well as converting existing customers into loyalty customer (Mermod, 2010:8).

Internet banking, as stated in Chapter One, is defined as “the use of banking services through the computer network (the Internet), offering a wider range of potential benefits to financial institutions due to more accessibility and user-friendly use of the technology” (Aladwani, 2001:220; Yiu, Grant, & Edgar, 2007:349). Thulani et al. (2009:4) define Internet banking “as systems that enable bank customers to get

access to their accounts and general information on bank products and services through the use of the bank's website, without the intervention or inconvenience of sending letters, faxes, original signatures and telephone confirmations". Chavan (2013:21) laments that the impact of the revolution of the Internet on the banking landscape has drastically changed the way banking and financial transactions are conducted these days. Also, various studies depict the Internet banking in the form of electronic banking, online banking, and e-banking. However, e-banking entails the provision of banking products and services through electronic delivery channels. With Internet banking, customers can perform, electronically, a wide range of transactions, such as issuing cheques, paying accounts, transferring funds, statements generation, and inquiring about account balances through the bank's website-banking solution (Chavan, 2013:21). The e-payments system is one of the platforms that has been positively and greatly affected by the advent of Internet banking through the offering of many e-commerce applications such as online shopping, online auction, and Internet stock trading (Aladwani, 2001:221; Lee, 2009:774; Tan & Teo, 2000:145).

After the full deployment of Internet banking, especially in advanced countries, bank's website was mainly used to provide information to market products and, but with the technological development of secured electronic transactions, more banks have adopted it as a medium for transactional purposes (Tan & Teo, 2000:145; Yiu et al., 2007:349). Although online banks (banks without physical branch presence) have been expanding their presence in the market and adopting other channels such as call centres, their impact on the whole banking sector has been limited (Tan & Teo, 2000:145).

Pikkarainen, Pikkarainen, Karjaluoto, and Pahnila (2004:305) highlight two key reasons for the growth and propagation of Internet banking. The first of these is the cost savings potential for banks compared with the traditional channels; the second is the reduction of branch networks coupled with reduction in staffing costs associated with personnel.

Jayawardhena and Foley (2000:40) supported the statement above and added that the increase in the customer base of the bank is largely due to the deployment of multiple distribution channels by these banks such as branch networks, Internet banking and mobile banking and this gives the banks a large market coverage by facilitating different products to be targeted at different segments of the market. Thus, niche markets are created through the deployment of this channel. The result is that banks with large customer bases can profit from marketing and communication, with the possibility of mass customisation for each group of clients, offering innovative products. These authors further argue that this is an important issue for banks since many organisations are saturated with mass automation and homogenised products and services. But in the view of the customer, there is an increase in autonomy where they become less dependent on the branch, and consequently spend less time and effort in executing transactions. Additionally, Internet banking users can benefit from financial products that are exclusive online, and these may have higher returns than those in the traditional channels of banks.

With this medium of conducting banking transactions, Hitt and Frei (2002:736) and Xue et al. (2011:295) advocate some of the advantages or benefits that the customers of these banks stand to gain which includes the opportunity for increasing their levels of banking activity, acquisition and usage of more products and services as well as the ability to maintain a higher level of asset and liability balances, demonstrating the importance of the use of the Internet medium other than the traditional brick-and-mortar banking business. Additionally, it is deemed that customers who conduct a lot of banking transactions will adopt this medium to achieve a greater efficiency in their banking dealings, whilst customers with access to the Internet and those who dwell in areas with a greater concentration of online banking adopters, will be faster to adopt Internet banking than those who do not. After the adoption of Internet banking, it is anticipated that these customers will be loyal customers to the bank thereby reducing the attrition rate.

Even though many benefits of the Internet banking has been enumerated above, risk and trust-related issues are very important to the customers who uses this channel and therefore might not all be well enthused with this new channel. Most of the customers may still prefer to use the traditional e-products such as ATMs, together with personal and telephone contact (Lee, 2009:133). These customers would need access to a computer with Internet facilities, which suggest that, for online banking to strive, a customer is solely dependent on technology. In this case a third party service is required by the bank to run the online banking services to their clients (SAS Institute AB, 2000:28).

Given that Ghana is a developing country where the use of computers is comparatively low (less than half of the population has access to computers), Internet banking is an issue which largely depends on other computers or web servers. In spite of significant improvement in access to the cellular mobile telephone and Internet services realised in recent times due to telecom sector reforms, Africa (and Ghana for that matter) has the lowest Internet penetration rate in the world. Since Internet service was introduced in Ghana in 1995, Internet usage has increased with time but the level of penetration remains low due to high tariffs relative to income levels, limited telecommunications infrastructure and low penetration of computers. In case of any problem regarding safety or usage, a customer cannot have access to his or her account. Internet banking users must know how to use a computer before they can carry out a transaction. The customers need to be aware of and up-to-date with the latest safety programmes such as firewalls, virus programmes to avoid hacking and data damage.

3.3 BACKGROUND OF INTERNET BANKING IN GHANA

Banking in Ghana has undergone many changes in service delivery with the ultimate intention of improving the quality of service being provided to customers. Customers were served through the manual system, which resulted in long queues to transact

business (Hinson, 2004:48). Ghana's earliest forms of Internet, electronic and communications technologies usage were mainly office automation devices such as telephones, telex and facsimile machines to speed up and make more efficient the process of servicing clients. Banking started in Ghana in 1953 with the opening of the Bank of England. Banking polices in Ghana changed with the coming into force of the Bank of Ghana Ordinance No. 34 of 1957 which suited the banking circumstances at the time. Moody (2002) is of the view that online banking is the fastest growing service that banks can offer in order to gain and retain a sizeable market share, reduce transaction costs, and offer better and quicker response to market changes.

A new paradigm began with the introduction of the Bank of Ghana Act (2002:5) which gave autonomy to the central bank, with the mandate to manage the monetary and fiscal policies in Ghana. Before the attainment of independence in 1957, Ghana had mainly three banks, namely the Bank of British West Africa (now Standard Chartered Bank Ghana Limited), Barclays Bank D.C.O (now Barclays bank of Ghana Limited), and Ghana Commercial Bank. As at the first quarter of 2014, Ghana had 27 banks with a network of almost 900 branches, 123 rural banks, 24 savings and loans companies operating alongside a sizeable number of non-bank financial institutions, and micro-finance institutions (Acquah, 2014).

Ghana was one of the first African countries south of the Sahara to connect to the Internet and introduce asymmetric digital subscriber line (ADSL) broadband services. In and around the mid-1990s, banks in Ghana began a gradual use of computerised technology in their operations. From 2000 onwards, ICT has become a core strategic tool for competitive advantage for the banks (Woldie et al., 2008:36). Banks used the new technologies in computerisation of counter processes, networking of branches across Ghana, introduction of ATMs, smart cards and debit cards, telephone banking, SMS banking and finally, Internet banking. By 2014, all 27 banks offered Internet banking services to their customers. These were basically to check account

balances, print or download statements, and transfer funds between internal accounts (Ntsiful et al., 2010:42).

As a result of the increasing value placed on modern information and communication technologies for the delivery of financial services, the analysis of the determinants of Internet banking adoption has become an area of growing interest to researchers and managers. For this reason, most studies in this area tend to focus on bank-specific and market-specific factors (Sullivan & Wang, 2005:329,a).

3.4 DETERMINANTS OF INTERNET BANKING ADOPTION

Research shows that with the exception of bank size, the more commonly analysed bank-specific variables are only sporadically associated with adoption of Internet banking to a statistically significant degree. Notably, the financing strategy of a bank (bank deposits), is mostly included as a possible determinant factor of Internet banking (Malhotra & Singh, 2007:325).

One of the main or important organisational variables that determines the adoption of Internet banking is said to be a bank's association with a holding company. Thus a bank operating in a local geographical market who has the parent company overseas or linkages with a foreign parent company largely influence customers perception to adopt their Internet banking channel (Furst et al., 2000:99; 2002:102; Hasan et al., 2002:59; Courchane et al., 2002:355; Nickerson & Sullivan, 2003:352; Sullivan & Wang, 2005:329; DeYoung et al., 2007:1045,a).

Another important determinant of Internet banking is the market-specific variable which encompasses the concentration index (Courchane et al., 2002:355; Nickerson & Sullivan, 2003:352; Bughin, 2001:53; 2004:54; DeYoung et al., 2007:1052,a), imitation of early adopters (Sullivan & Wang, 2005:329; DeYoung et al., 2007:1045,a); as well as other market characteristics that depicts the rate at which customers are demanding the use of the Internet banking channel. This is largely

influenced by factors such as the location of the bank (either rural or urban) (Furst et al., 2000:100; 2002:102; DeYoung et al., 2007:1045), jurisdiction with very high rate of literacy coupled with a population generally made up of the younger generation who has the appetite for the use of information technologies (DeYoung et al., 2007:1033; Courchane et al., 2002:355;). Other determinant factors such as the per capita income of a particular geographical location and the economic conditions of the location or country also influences the rate of adoption of Internet (Courchane et al., 2002:359; Sullivan & Wang, 2005:323; DeYoung et al., 2007:1045; Nickerson & Sullivan, 2003:352;). Bughin, (2001:140; 2003:123; 2004:120) also state that a country's Internet literacy rate also impact on how easily customers accept the Internet banking channel for banking transactions. Various studies has therefore classified the Internet adoption factors into two main categories, namely push (supply or bank-specific) and pull (demand or consumer-specific) factors by taking into consideration various technological, environmental and market specific structure variables (Malhotra & Singh, 2007:325).

The following are some of the other determinants of Internet banking adoption. The ***size*** of the bank is one of the most important factors or determinant of Internet banking by both customers and banks alike. Thus, the introduction of Internet banking services is facilitated by the bank's reputation in terms of its size (Musiime & Malinga, 2011:265). According to Sullivan (2000:163), bank size and organisational characteristics usually influence the adoption rates. Sullivan (2000:163) explains that a bank can generate a large number of Internet transactions if it has a sizeable customer base which translates into a high participation rate among its customers, and customers who actively use the system. Success therefore depends largely on generating online transactions. It is generally assumed that bigger firms lead the innovation and diffusion processes due to the existence of economies of scale and scope in research and development activities and in the application of their results (Buzzacchi et al., 1995:160; DeYoung et al., 2007:1004,a). Keeton (2001:27) argue that large banks' or bank with large customer base may be more competitive than

their competitor smaller banks due to the huge investment in fixed costs of developing information management systems thereby creating strong brand recognition among consumers. In their study on banking technology adoption, Hernández-Murillo, Llobet and Fuentes (2008:78) found that size is a relevant determinant and therefore has an expected positive effect on the decision to adopt. Larger banks are likely to adopt since the cost of adoption is quite invariant with the size of the bank. With the exception of Bughin (2001:140; 2003:123; 2004:121), research has shown that there is a positive relationship between bank size and an adoption decision. Thus, the larger the bank, the more likely it is that it will offer Internet banking.

Age of a bank, among others factors, determines the adoption of Internet banking (Maholtra and Singh, 2007:327; Corrocher, 2002:134; Sullivan & Wang, 2005:301, Hannan & McDowell, 1984:357). The age of the bank is deemed as a basic alternative as it is expected that the longer the existence of a bank, the more it has gone through various learning curves or stages and has acquired great wealth of knowledge and experience in general in order to be able to reduce its perceived risk of investments in Internet banking. Therefore it is expected that the age of a bank would tend to increase the probability of adoption of Internet banking. However, it is expected that the coefficient of new bank would be negative due to the fact that new banks are expected to be more flexible in their approach in doing business; they do not have an inherited bad infrastructure or systems to deal with and they face little managerial challenges in the adoption of the new technology. Again, it is expected that new banks may find it less costly to implement the Internet banking technology to resonate with its technology or banking systems whereas the older banks that must add Internet banking to its existing banking infrastructure or systems (Ang & Koh, 1997:173; Sullivan & Wang, 2005:326, b). This argument is supported by Furst et al. (2000:98) and Sullivan (2000:162) who argue that there is a negative relation between the age of a bank and the rate of adoption of Internet banking.

Malhotra and Singh (2009:331) in a univariate analysis indicate that Internet banks are larger banks and have better operating efficiency ratios and profitability than non-Internet banks. Internet banks also rely more heavily on core deposits for funding than non-Internet banks do. Internet banks have higher asset quality and are better managed to lower the expenses for building and equipment. Therefore, a bank with large ***deposit*** base may influence the prospect of adopting Internet banking. Banks which are less reliant on traditional sources of funding may pursue a more aggressive overall business strategy, including the adoption of Internet banking (Furst et al., 2002:102). This is supported by (Andriy, 2001:89; Sullivan 2000:157) who argue that there is a positive relation between the deposits base of a bank and the decision to adopt electronic banking.

Thirdly, the ***wage bill*** of a bank shows is also in important indicator in the determinants of Internet banking. Sharma, (1993:56); Gretton et al., (2003:152) depicted the ability of a bank to reduce the amount spent on its staff (human resource) as a result of embracing the Internet channel. It includes salaries and other cost associated with staff emoluments and other overhead cost (Sinha & Chandrashekran, 1992:167; Gourlay & Pentecost, 2005:12). These authors maintain that the adoption of Internet banking serve as an attractive point for a bank with high wage bills to reduce it. Also, the average wage bill may depict the employment mix of the bank, since a high value for wages may reveal a higher proportion of managerial and technical employees who are required for the proper functioning of Internet banking. Malhotra and Singh (2009:328) therefore state that there is a positive correlation between wage bill and the adoption of Internet banking.

Internet banking has been proven to reduce costs and ***expenses*** related to maintaining a physical branch and employing customer service staff. Furst et al., (2001:101; 2002:105) again laments that banks with comparatively high expenses for office accommodation and other fixed assets may view adoption of Internet banking as a way to reduce expenditures devoted to maintaining a branch network. According

to Sullivan (2000:159), Internet bank appear to be successful at generating sufficient revenue, such as fee income, to overcome additional expenses. The adoption of Internet banking therefore appears more attractive to these banks experiencing higher fixed expenses. Treadwell (2000:201) emphasises that Internet banking allows larger banks to reduce their expenses due to their many physical branches, whereas smaller banks tend to incur costs and take time to recover initial investment in e-banking technology. Timmons (2000:210) adds that the only motivation for smaller banks to invest in e banking technology was the reduction of costs in the long term and competitive advantage over their competitors. Thus, it is expected that expenses would be positively related to Internet banking adoption.

A common measure of profitability is the ***return on assets***. Return on assets tends to show the profitability of the bank and how sustainable its operations are. It and depicts whether it has an independent effect on the decision to adopt Internet banking (DeYoung et al*.,* 2007:1008,a). However, Buzzacchi et al*.* (1995:159) disagree with this argument and are of the view that it is possible that more profitable banks will choose to incur the costs of offering Internet banking, both because they are financially more able to do so and because they believe that doing so will help them maintain their competitive position (Malhotra & Singh, 2009:328).

Furthermore, it is possible that less profitable banks may be more willing to invest in Internet banking to improve their performance. Hernandez-Murillo, Llobet and Fuentes (2008:74) identify return on assets as having a negative and statistically significant effect on the adoption decision. They clarify that an increase of one percentage point in the return on assets decreases the probability of adoption by about 25 basis points per quarter. In addition, less profitable banks are hard-pressed to adopt online banking sooner, perhaps as a way of exploring new business opportunities in an attempt to improve profitability. Other authors (Bughin, 2001:140; Corrocher, 2002:134; Buzzacchi et al., 1995:159; Gourlay & Pentecost, 2005:12)

support this argument, concluding that profitability is an ineffective factor in the decision-making process especially in the case of Internet banking adoption.

Banks endeavour to improve their service quality by understanding their customers' perceptions and expectations. In order to create satisfied customers, it is important for banks to improve their Internet banking since failures cause them to lose their customers. Banks which fail to deliver according to customer expectation will affect customers' satisfaction negatively. Therefore, an understanding of Internet banking will help to improve the ***market share*** of banks. Courchane et al. (2002:364) indicate that a bank's market share measures the size of the bank relative to its own market. In markets where big banks have already adopted online banking, small institutions may be compelled to also adopt online banking as a way to preserve their market share against products perceived as superior (Hernandez-Murillo, Llobet & Fuentes, 2008:76). The expectation is that as market share increases, the probability that a bank adopts Internet banking will increase. However, it may also be possible that banks with lower market share may adopt Internet banking to increase their customer base. Thus, the expected sign for bank market share is ambiguous.

Xue et al. (2009:291) affirm that higher levels of branch intensity are associated with higher levels of investment in IT-based channels, suggesting a complementary relationship between branch channel and IT-based channels. In addition, they found customers' adoption of Internet banking to be associated with increased usage of branch services, suggesting that investments in ***branches*** and Internet banking are complements. Branch intensity is therefore an important characteristic which banks' need to consider since it may influence the probability to adopt Internet banking. More intensively branched banks can see great potentials for costs savings and the possibility of increasing the efficiency of their existing operations .

Hence, banks with higher branch networks have higher probability to adopt Internet banking with a possible reduction of future networks in mind (Courchane et al., 2002:357). On the other hand, it has been argued that banks without a large branch

networks will seize on Internet banking as an inexpensive means to expand their customer bases. Given this ambiguity, it is not possible to make any prior assumption on the effect of branching intensity on the adoption (Furst et al., 2001; 2002; Andriy, 2001). Malhotra and Singh (2007:328) find that evidence of lower branch intensity suggests a higher probability of adoption of the Internet technology. Banks with smaller market share therefore see the Internet banking technology as a means of increasing market share by attracting more customers through this new channel of delivery.

Rose and Joskow (1990:121) as well as Tufano (2003:212) posit that the nature of the category of bank also impacts on the adoption of technology, especially in relation to Internet banking. They argue that if the bank happens to be a private bank ownership (whether domestic or foreign), the probability of adopting Internet banking is very high due to the private ownership involved in decision-making. These authors further state that, owing to the manner in which firms react to observed behaviour of rivals in reaching their adoption decisions, the proportion or ***percentage*** of banks which have already adopted Internet banking may also have an influence on the decision to adopt Internet banking. This variable also captures the degree to which the bank has been preceded in the market and may encourage adoption by reducing the uncertainty concerning the technology's effectiveness or cost. Adoption by rivals will presumably reduce profits for the potential adopters. However, it may also reduce profits obtainable in the absence of the innovation, as customers are lost to adopting rivals who offer a better service (Sullivan, 2000:163). Hannan and McDowell (1987:146) found that the adoption of ATMs by rivals increases the conditional probability that a decision to adopt will be made.

Some authors (Ndubisi & Sinti, 2006:17; Rotchanakitumnuai & Speece; 2003:313) suggest that perceived risk plays a critical role in the adoption of Internet banking. Ostlund (1974:57), in a non-banking context, identified perceptions of risk as a characteristic which influences the rate of adoption of innovation or technology

(Labay & Kinnear 1981:218; Holak 1988:251). They defined risk as the uncertainty about what the innovation gives. However, Wang et al., (2003:727) admit that it is very difficult to address risk objectively in the context of Internet banking services. It is relatively easier to address key potential risk issues that may have an adverse impact on the adoption or rejection of Internet banking services.

Black et al. (2001:43) argued that risk is the occurrence of an error and the security aspect of Internet banking. Subsequently, Polatoglu and Ekin (2001:160) considered risk in terms of financial, physical and social characteristics. Associated with the perception of good security is the presence on the website of a third party guaranteeing security, together with a privacy statement that promises the minimisation of risk and privacy breaches to potential Internet banking users. The more the user's aversion to risk and privacy concerns are lowered, the more they are likely to adopt Internet banking services. Trust was another form of risk postulated by Hewer and Howcroft (1997:233).

Parasuraman (2000:316) identifies additional four factors that may affect the adoption of Internet banking by customers and defines them as follows:

- Optimism: The degree to which people with a positive view of technology believe it offers increased control, flexibility and efficiency in their lives.
- Innovativeness: The degree to which people are technological pioneers and thought leaders.
- Discomfort: The degree to which people perceive a lack of control over technology and feel overwhelmed by it.
- Insecurity: The degree to which people distrust technology and are skeptical of its ability to work properly.

The author states that optimism and innovativeness are drivers of technology readiness, while discomfort and insecurity are inhibitors. He refers to technology readiness as the "people's propensity to embrace and use new technologies to

accomplish goals in home life and at work" (Parasuraman, 2000:315). These factors are a combination of positive and negative technology-related beliefs. Collectively they coexist to determine a person's predisposition to interact with new technology (Parasuraman & Colby, 2001:255). These factors therefore suggest that, if customers are not ready to be Internet banking users, they are likely to express discomfort and insecurity about the service, and feel less optimistic and innovative about the technology. Optimism and innovativeness are drivers of technology readiness and a high score on these dimensions will increase overall technology readiness. Discomfort and insecurity, on the other hand, are inhibitors of technology readiness and a high score on these dimensions will reduce overall technology readiness (Parasuraman, 2000:315).

The author identifies "appearances" as a fifth factor in technology adoption. However, he states that because of its poor predictive power in relation to a shopper's likelihood to continue purchasing from the same website, this factor should be discounted. The Sullivan (2000:164) study of customers who use Internet banking found that consumers are obliged to return to the same bank home page time and time again in order to carry out their banking transactions. Hence, while Parasuraman (2000:320) justifies his decision to exclude appearances from the rate of adoption factors, Sullivan (2000:164) reasons that since there may be service providers with whom repeat patronage is essential, for those service users who make repeated contact with the bank providing Internet banking services, appearances may strongly influence their readiness to use technology.

Ostlund (1974:57), in expanding Rogers' (1962:265) theory on the innovation diffusion adoption process, found that adopters are more innovative, less risk-averse, perceive an innovation as being less complex and as offering more advantages than non-adopters. The perceptions of non-adopters about the same factors are usually the complete opposite and therefore non-adopters were found to be less innovative, more risk-averse. Black et al. (2001:44) and Gerrard and Cunningham (2003:17) also

sought to evaluate the theory of diffusion in the context of Internet banking to establish if there were grounds for extending this theory. Gerrard and Cunningham (2003:20,b) found that adopters perceive Internet banking as being more convenient and more compatible with the adopter's lifestyle while non-adopters perceived the service as being more complex and requiring a high level of computer skills.

3.5 SUMMARY

This chapter highlighted the concept of Internet banking as well as the current development of Internet banking in Ghana. A review of literature of some of the determinants of Internet banking adoption was also considered from the perspective of the bank to determine some variables, both operational and strategic, which banks take into consideration when deploying Internet banking for its customers.

It is evidenced from this chapter that banks operating in Ghana face many challenges such as low access to computers and the Internet for that matter coupled with low penetration rate of the internet and all these are influenced by many variables. The size of the bank's balance sheet and its overall financial stability has to be considered when deploying Internet banking. This stems from the fact that it is very expensive to set up the Internet banking technology for use by customers due to the huge initial capital outlay required. Also, the use of Internet banking as a medium to transact business is a relatively new phenomenon in Ghana and therefore the PU of the medium by both clients and the bank will determine its success. Thus, the higher the PU of the Internet, the higher and faster would these customers embrace the use of the Internet for business transactions. .

It is imperative for banks to note that there are particular variables that may affect the deployment and acceptance of Internet banking in Ghana. This chapter therefore sought to discuss the variables as identified in the literature, which may influence banks' Internet banking deployment and acceptance.

CHAPTER FOUR
RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

The adoption of Internet banking may be influenced by various variables. Factors such as market share, loan performance, bank size, business strategy, operational efficiencies as well as attitudes, PU and PEOU are variables that may possibly influence the extent to which both customers and banks will adopt Internet banking. Chapters Two and Three provided the theoretical basis for the researcher to further investigate these factors.

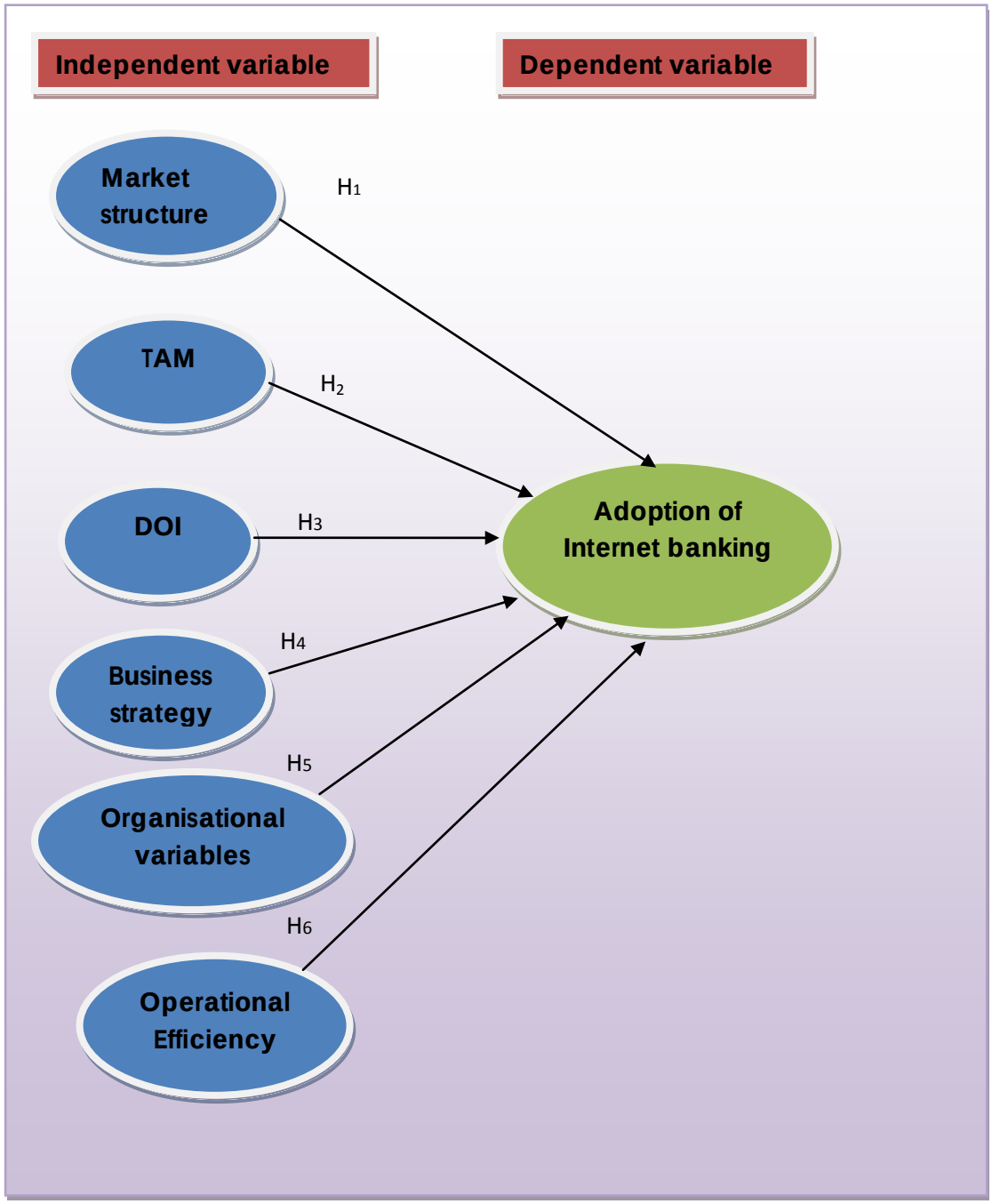
The research methodology of the actual empirical investigation of the study is presented in this chapter. It is a continuation of the introduction to methodology of the study as presented in Chapter One. This chapter presents the research design, measuring instruments and data collection methods, details surrounding the sample selection, together with the data analysis method used for the empirical investigations.

For the purposes of this study, as previously discussed, specific independent variables have been identified which were indicated in Figure 1.3. These variables are market share, loan performance, bank size, business strategy, organisational variables, operational efficiencies as well as DOI and TAM. This study proposes that the adoption of Internet banking by banking clients is being influenced by these factors from the perspective of both the client and the bank.

For ease of reference, the conceptual framework is represented again as Figure 4.1 below. The conceptual model specifies Internet banking adoption as the dependent variable, while market share, loan performance, bank size, business strategy, organisational variables, operational efficiencies, DOI and TAM are independent

variables. The conceptual model depicts the empirical investigation of this study, for which the research methodology is explained.

Figure 4.1: Proposed research model



Source: Researcher's own construction

This single conceptual model is used for both groups of respondents (banking clients and bank managers). The determinants as envisaged between the various factors as depicted in the figure are clearly described in the previous chapters of this study. The analysis of the secondary data sources led to the development of the conceptual model which is to be tested in the empirical investigation.

It is important for this research to establish the influence of the independent variables on the dependent variables relating to Internet banking adoption in Ghana. This involves establishing whether the factors as described in the secondary sources will be accepted or rejected in Ghana. In order to study the variables that determine the adoption of Internet banking, Chapter Four presents the research methodology chosen for the empirical investigation conducted among banking clients and bank managers regarding factors relating to Internet banking adoption in Ghana.

4.2 RESEARCH TYPES

According to Collins and Hussey (2003:10), there are different categories of research which are used to classify research studies. These categories are based on the processes, purpose, logic and outcome of the research. The table below depicts the various classification bases and the resultant type of research.

Table 4.1: Types of research

Research classification	Type of research
Process of the research	Qualitative or quantitative
Purpose of the research	Exploratory, descriptive, analytical or predictive
Logic of the research	Deductive or inductive
Outcome of the research	Basic or applied

Source: Collins and Hussey (2003)

According to the above table, each of the type of research will now be discussed to enable classification of the current research.

4.2.1 Qualitative and quantitative research

Qualitative research refers to the “meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things” (Berg, 2007:3). This research approach seeks to explain a particular situation where it allows researchers to study issues of every case in depth rather than seeking to reach a general profile of the studied population (Hyde, 2000:84). It is also used in scientific research to study a phenomenon where relatively little information is known. Hyde (2000:84) advises that qualitative research provides an insight into questions that deal with the way people think about a certain subject and why they think that way. The emphasis of a qualitative approach is on the description and discovery which is based on data in the form of words rather than numbers (Yin, 2009:8).

Mills and Huberman (1994:5) also describe qualitative data as being usually in the form of words rather than numbers. Its sources are well-grounded; it has rich descriptions and explanations of processes in identifiable local contexts. Here, one can conserve a sequential flow, determine exactly which events lead to which consequences and derive fruitful explanations. It also leads to unanticipated findings and to new integration which helps researchers to get beyond initial concepts and to generate or revise conceptual frameworks. According to Gummesson (2000:336), qualitative research methods are the primary means by which almost all social research is conducted. This is a result of the fact that less scientific areas in the social sciences, which also are referred to as “soft”, lack dependability and precision (Milliken, 2001). The goal in qualitative research is to expand and simplify theories and not to establish the frequency in which a phenomenon is likely to occur in a population. It is also argued that even a single case may provide a basis for a theoretical explanation of a general phenomenon if that is studied in sufficient depth and with sufficient insight (Hyde, 2000:84). Qualitative research emphasises the

importance of getting close to the subject(s) of study because experience is a good way to understand social behaviour. It does not provide answers to questions such as how many people share a certain opinion (Ruyter & Scholl, 1998:8).

The objective therefore is to describe social reality from the perspective of the subject, not the observer. This has the advantage of viewing behaviour in its social setting, providing a greater depth of understanding and allowing greater flexibility (Locke et al., 1997:794). Qualitative research is a questioning research and searches for questions at the same time. It offers the flexibility to respond to the direction in which conversations with the respondents are going. For these reasons, a qualitative research provides “an in-depth insight; it is flexible, small-scale and exploratory and the results obtained are concrete, real-life and full of ideas” (Ruyter & Scholl, 1998:8).

Tewksbury (2009:43) argues that qualitative methods of research are often viewed by novices as easier because the actions of researchers look and sound similar to what people all do in regular daily life. But they are in fact more time-consuming, require a greater emphasis on researchers themselves clarifying and defining what things mean, and rely on the intellectual abilities of researchers to organise, manage, analyse and interpret data. Also, there is no single correct way to work with qualitative data.

The quantitative research process on the other hand, according to Aliaga and Gunderson (2000:5), involves explaining phenomena by collecting numerical data which is analysed using mathematically based methods (and statistics in particular). It proposes that one reason for quantitative research enjoying widespread heightened respect “lies in the predictive advantages this method of inquiry possesses”. Quantitative research is typically considered to be the more scientific approach to social science. The focus is on using specific definitions and carefully operationalising what particular concepts and variables mean. Indeed, the ability to make correct predictions is one of the more outstanding characteristics of quantitative methodology. Quantitative research fails to account for the full set of

potentially influential factors that may be important for understanding how experiences are constructed, or how varieties of cases are similar or different.

Quantitative research is regarded as being more objective than qualitative research as its emphasis is on finding facts or causes of social phenomena (Lancaster, 2005:66).

It also observes and studies human behaviour and focuses on uncovering general laws of relationship and/or causality (Welman & Kruger, 1998:64). The techniques used in quantitative research according to Collins and Hussey (2003:13) include experiments and surveys (questionnaires) and data is primarily gathered using research instruments that yield statistical data to analyse and interpret.

Table 4.2: Comparison between qualitative and quantitative research

Quantitative	Qualitative
Objective is to test hypotheses that the researcher generates.	Objective is to discover and encapsulate meanings once the researcher becomes immersed in the data.
Concepts are in the form of distinct variables	Concepts tend to be in the form of themes, motifs, generalisations, and taxonomies. However, the objective is still to generate concepts
Measures are systematically created before data collection and are standardised as far as possible; e.g. measures of job satisfaction.	Measures are more specific and may be specific to the individual setting or researcher; e.g. a specific scheme of values.
Data are in the form of numbers from precise measurement.	Data are in the form of words from documents, observations, and transcripts. However, quantification is still used in qualitative research.
Theory is largely causal and is deductive.	Theory can be causal or non-causal and is often

	inductive.
Procedures are standard, and replication is assumed.	Research procedures are particular, and replication is difficult.
Analysis proceeds by using statistics, tables, or charts and discussing how they relate to hypotheses.	Analysis proceeds by extracting themes or generalisations from evidence and organising data to present a coherent, consistent picture. These generalisations can then be used to generate hypotheses.

Source: Neuman, (1994)

A quantitative approach dominated this research as data collection and analysis methods involved statistical data. These methods were implemented to test the conceptual framework that was developed in Chapter One of this paper.

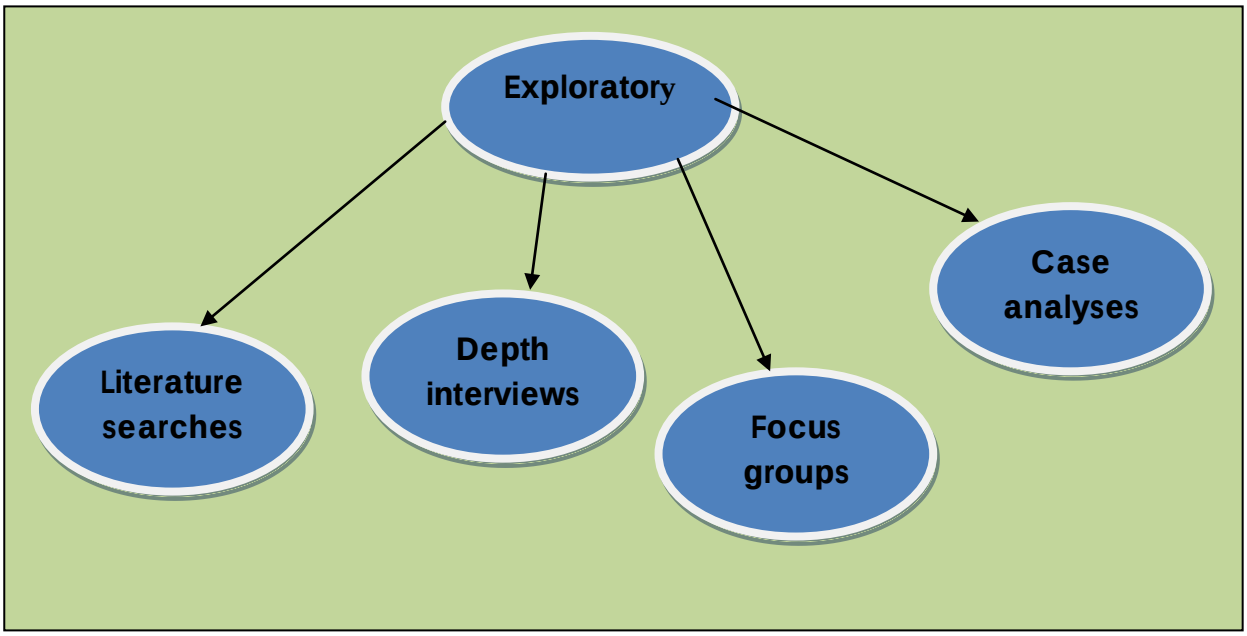
4.2.2 Explanatory, descriptive, analytical and predictive research

Neuman (1994:27) states that exploratory research involves the use of a literature search or conducting focus group interviews. The goal of exploratory research is to discover ideas and insights, thereby helping the researcher's need to better understand, test the feasibility of a more extensive study, and determine the best methods to be used in a subsequent study. Collins and Hussey (2003:10) argue that exploratory research design does not to come up with final answers or decisions but rather, researchers hope to produce hypotheses about what is going on in a situation. It provides very rich, meaningful information and definitive explanations for researchers.

For these reasons, exploratory research is broad in focus and rarely provides definite answers to specific research issues. The objective of exploratory research is to identify key issues and key variables. For instance, one outcome might be a better system of measurement for a specific variable. Some of the more popular methods of

exploratory research according to Cooper and Schindler (2003:11) include literature searches, depth interviews, focus groups, and case analyses.

Figure 4.2: Research designs



Source: Cooper and Schindler (2003)

As noted in Chapter One, a lack of in-depth research in the area of Internet banking adoption determinants in Ghana, means that this research features elements of explanatory research design.

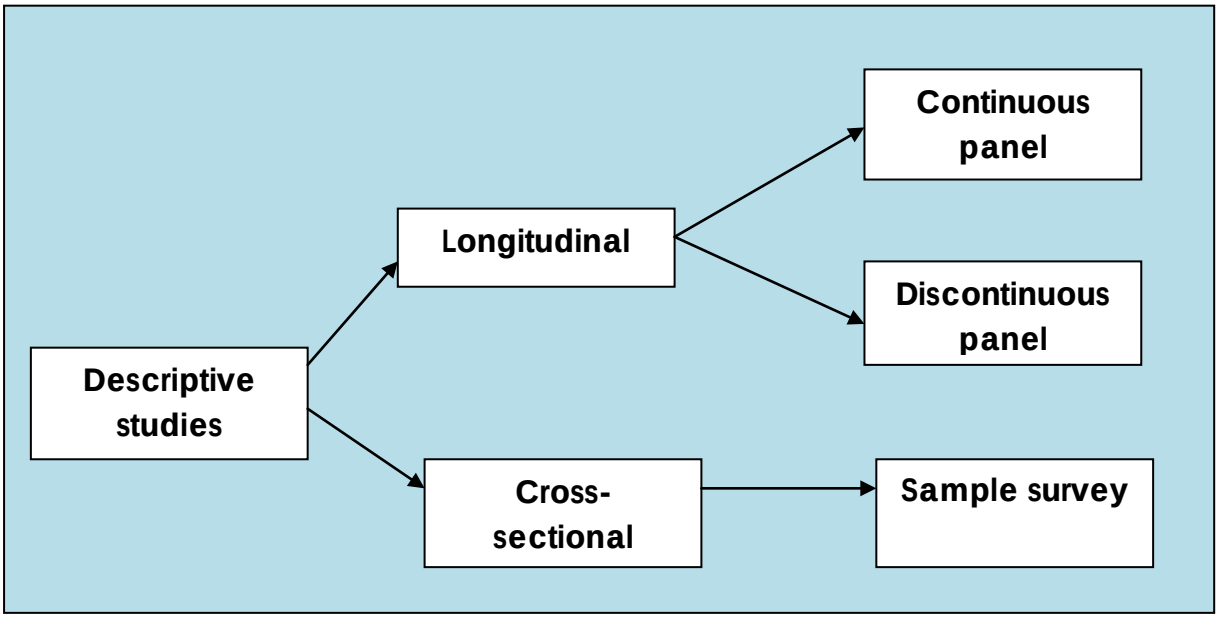
As its name suggests, descriptive research seeks to provide an accurate description of observations of a phenomenon design where the major emphasis is on determining the frequency with which an event occurs or the extent to which two variables co-vary (Cooper & Schindler 2003:10). The objective of most descriptive research is to map the terrain of a specific phenomenon. Studies of this type usually start with questions such as: “What similarities or contrasts exist between variable A

and B". Descriptive research comparisons produce useful insights and lead to hypothesis formation.

Neuman (1994:28) indicates that descriptive research is used for purposes such as describing the characteristics of certain groups, determining the proportion of people who behave in a certain way, making specific predictions as well as determining relationships between variables. Descriptive data becomes useful for solving problems only when the process is guided by one or more specific research problems, and when much thought and effort, and quite often exploratory research to clarify the problem and develop hypotheses has occurred. Cooper and Schindler (2003:10) refer to two types of descriptive studies, these being cross-sectional and longitudinal.

Cross-sectional research involves drawing a sample of elements from a population of interest through the adoption of a technique called a sample survey. Characteristics of the elements, or sample members, are measured only once. A longitudinal study, on the other hand, involves a panel, which is a fixed sample of elements. The panel or sample remains relatively constant through time, although members may be added or replaced to keep it representative. Furthermore, the sample members in a panel are measured repeatedly over time, in contrast with the one-time measurement in a cross-sectional study. Longitudinal study also involves two types of panels, namely continuous panels (sometimes called true panels) and discontinuous panels (sometimes called omnibus panels). See Figure 4.3 below.

Figure 4.3: Descriptive research design



Source: Cooper and Schindler (2003)

This study therefore describes each of the various relationships between the variables as stated in Chapter One which determine the adoption of Internet banking.

Analytical research also known as explanatory or causal research according to Gregor, (2006:621) is used in testing hypotheses that specify how and why certain empirical phenomena occur. It is mainly concerned with quantifying a relationship or comparing groups. The aim often is to identify a cause–effect relationship and it is usually conducted through a controlled experiment (fixed design) and supported by quantitative data. Also, it promotes comparison and statistical analysis. Collins and Hussey (2003:11) mention that analytical researchers use existing theories and hypotheses to identify the existence of relationships between variables. Examples of explanatory research which has been pursued in the IS literature includes: determinants of auction prices (Ariely & Simonson, 2003); diffusion and non-diffusion of e-commerce among SMEs (Grandon & Pearson, 2004); attitudes towards online security and privacy (Malhotra, Kim, & Agarwal, 2004:348); understanding the

antecedents and consequences of online trust (Gefen, Karahanna & Straub, 2003:54) and the impact of overlapping auctions (Jank & Shmueli, 2007:3).

In contrast to the proliferation of explanatory research, predictive research according to Gregor (2006:622) is an extension of the explanatory research whereby, instead of explaining existing phenomena, it is rather aimed at predicting the future or new observations with high accuracy.

There are two main reasons why predictive research is important, especially in IS (Malhotra, Kim, & Agarwal, 2004:338). First is its value for building theory in fast-changing environments such as the online environment that poses many challenges for the economic, psychological, and other theoretical models traditionally employed in IS. Predictive research plays a major role in theory-building where it shows new patterns and behaviours and helps uncover potential new causal mechanisms, which in turn leads to new theories being developed, provided the model is interpretable. Secondly, it provides a way out of the rigor relevance puzzle. Predictive research also serves as a statistically rigorous “reality check” to test the relevance of theories and the strength of explanatory causal models.

For part of this research, accurately predicting future behaviour of Internet banking adopters is more important than merely explaining past behaviour without any reference to future behaviour, since it is anticipated that future behaviour will guide actions of banks in their diffusion of technology.

4.2.3 Deductive versus inductive research

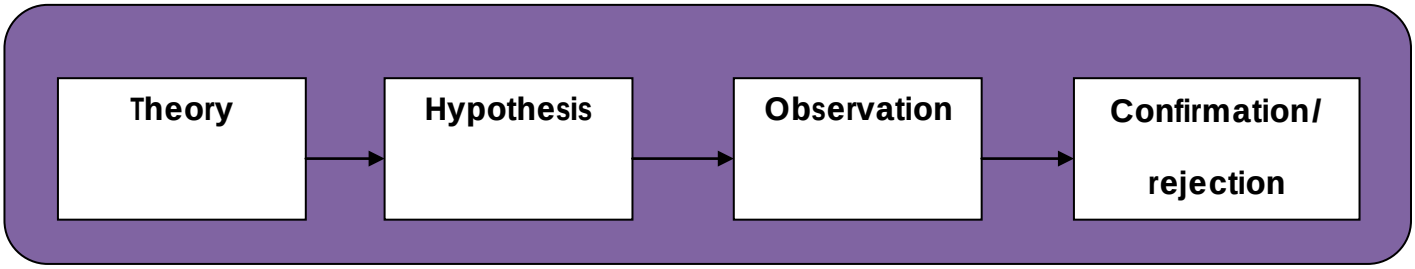
According to Lancaster (2005:22), a deductive approach to research is “concerned with developing a hypothesis based on existing theory, and then designing a research strategy to test the hypothesis”. Monette, Sullivan and DeJong (2005:62) further explain deductive approach as by means of hypothesis, which can be derived from the propositions of the theory. Thus, deductive approach is concerned with

deducting conclusions from premises or propositions. “Deduction begins with an expected pattern that is tested against observations, whereas induction begins with observations and seeks to find a pattern within them (Beiske, 2007:42).

> Deductive means reasoning from the particular to the general. If a causal relationship or link seems to be implied by a particular theory or case example, it might be true in many cases. A deductive design might then test to see if this relationship or link did obtain on more general circumstances (Gulati, 2009:42).

Snieder and Larner (2009:16) support the above arguments and state that in the deductive approach, reasoning starts with a theory and leads to a new hypothesis, which is going to be confirmed or rejected as result of the research. This is illustrated in the figure below.

Figure 4.4: Deductive research design



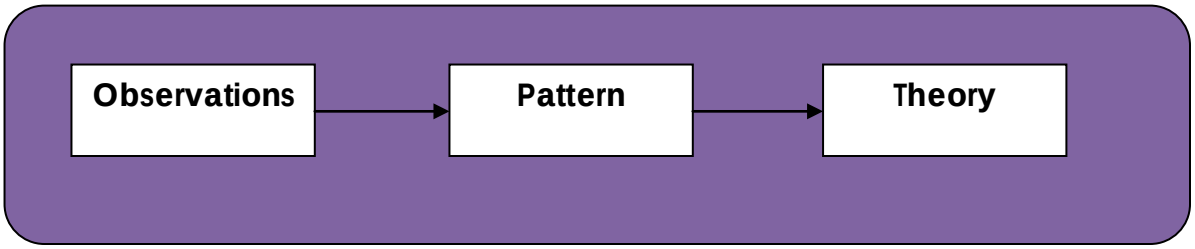
Source: Snieder and Larner (2009)

Beiske (2007:46) affirms that the deductive research approach explores a known theory or phenomenon and tests if that theory is valid in given circumstances.

This study can be classified mainly as an adaptation of the deductive process because theoretical knowledge from the literature overview was used to establish hypotheses in conceptual models to be tested in the empirical investigations.

Neuman (2003:51) establishes that the inductive research approach is conducted through observations and formulation of theories towards the end of the research and as a result of observations. Inductive research "involves the search for pattern from observation and the development of explanations – theories – for those patterns through series of hypotheses" (Bernard, 2011:7). In other words, no theories would apply in inductive studies at the beginning of a research study and this enables the researcher to alter the direction of the study after the research process had commenced.

Figure 4.5: Inductive research design



Source: Snieder and Larner (2009)

Inductive approach "essentially reverses the process found in deductive research" and concludes that no hypotheses can be found at the initial stages of the research (Lancaster, 2005:25).

The inductive process was used, to a small extent in this study due to the fact that the researcher interviewed bank CEOs, IT managers and customer service managers in order to use their responses to develop the measuring instruments.

4.2.4 Basic versus applied research

Applied research is defined by Blumberg, Cooper and Schindler (2005:13) as a situation where the researcher attempts to find solutions for specific problems and is thus concerned with the practical application of research findings. It is also research

with a practical problem-solving emphasis as it seeks to find answers to specific questions.

This study also has an applied research element as it aims to apply its findings to solve specific and existing technology adoption issues facing banks in Ghana.

Basic research (which is also termed pure or fundamental research) is conducted when the researcher aims to generate a body of knowledge by trying to comprehend or understand certain problems (Russell & Purcell, 2009:2; Cooper & Schindler, 2003:12). This presupposes that basic research is conducted to improve the understanding of a general issue (Collins & Hussey, 2003:14).

Because various theories have been reviewed (as detailed in Chapter Two) to explain certain situations in the adoption of technology and especially Internet banking, this study can also be classified as basic research.

4.3 RESEARCH PARADIGMS

A paradigm is simply a belief system (or theory) that guides the way things are done, or more formally establishes a set of practices. This can range from thought patterns to action. According to Guba (1990), paradigms can be characterised from their ontology (what is reality), epistemology (how do you know something) and methodology (how to go about finding out). These characteristics create a holistic view of how people view knowledge – in other words, how people see ourselves in relation to this knowledge and the methodological strategies researchers use to uncover or discover it. Burns and Burns (2008:13) state that there are two main research paradigms and these are the positivistic (quantitative) and the phenomenological (qualitative, interpretivist, or constructivist) paradigms.

Positivism is grounded in a research philosophy which asserts that the “social world exists externally, and that its properties should be measured through objective methods, rather than being inferred subjectively through sensations, reflection or intuition” (Easterby-Smith, Thorpe & Lowe, 2002: 53). It adheres to the view that only “factual” knowledge gained through observation (the senses), including measurement, is trustworthy. Also the role of the researcher is limited to data collection and interpretation using an objective approach and the research findings are usually observable and quantifiable (Collins, 2011:38). Furthermore, it depends on quantifiable observations that lead themselves to statistical analysis as well as being in accordance with the empiricist view that knowledge stems from human experience. “It has an atomistic, ontological view of the world as comprising discrete, observable elements and events that interact in an observable, determined and regular manner” (Collins, 2011:38).

Crowther and Lancaster (2008:79) state that as a general rule, positivist studies usually adopt the deductive approach. Moreover, positivism relates to the viewpoint that a researcher needs to concentrate on facts. They further propose that if a researcher assumes a positivist approach to a study, then it is the belief that the researcher will be independent of the research and the research can be purely objective.

“Phenomenology paradigm of research advocates the scientific study of immediate experiences and focuses on events, occurrences and happenings as one experiences them, with a minimum of regard for the external, physical reality” (Fellows & Liu, 2008:70). Thus, in phenomenology studies, ideas are generated from rich amounts of data by the means of induction and human interests, as well as researchers’ perspectives and reflections on the study.

The qualitative research methods used in the phenomenological paradigm aim to study and document authentic behaviour in a real situation. The qualitative

approaches often use thoughtful reflections, interpretation and analysis of verbal and/or written content (Burns & Burns, 2008:15-19).

Alternatively, the differences between positivist and phenomenology paradigms are best illustrated by Easterby-Smith, Thorpe, and Lowe (1991:28) in the following table:

Table 4.3: Research paradigm

	Positivist paradigm	Phenomenology paradigm
Basic notions	The world is perceived as external and objective	The world is perceived to be socially constructed and subjective
	Independency of the observer	Observer is considered a part of the object of observation
	Value-free approach to science	Human interests drive science
Responsibilities of researcher	Focusing on facts	To be focusing on meanings
	Causalities and fundamental laws are searched	Aiming to understand the meaning of events
	Phenomenon are reduced to the simplest elements	Exploring the totality of each individual case
	Hypotheses formulation and testing them	Ideas are developed by induction from data
Most suitable research method	Concepts have to be operationalised	Using several methods in order to different aspects of phenomena

Sampling	Samples have to be large	Small samples are analysed in a greater depth or over longer period of time

Source: Easterby-Smith, Thorpe, and Lowe (1991)

4.4 METHODOLOGICAL TRIANGULATION

The preceding discussions of qualitative and quantitative research as well as the positivistic and phenomenological perspectives introduced in sections 4.1.1 and 4.2 have ushered in the discussion of methodological triangulation of research.

In recent decades there has been a move among researchers to develop methods and approaches which provide a middle ground and some bridging between the two extreme viewpoints of research, known as triangulation (Easterby-Smith et al., 1991:139). Hussey and Hussey (1997:81) comment that the use of triangulation overcomes the potential bias and sterility of a single-method approach.

Both quantitative and qualitative research methodological triangulation was used for this study. A quantitative approach dominated the research's methodological triangulation because data was collected using two structured questionnaires and a statistical tool for data analysis. The qualitative aspect of this research, although smaller in capacity, was the use of in-depth interviews with bank CEOs, IT managers and customer service personnel. These interviews together with consultations with marketing experts were aimed at gaining an understanding of the current situation of Internet banking adoption.

4.5 RESEARCH DESIGN FOR THIS STUDY

From the discussions above, it can be seen that this study involves the use of data and methodological triangulation and therefore combines positivistic and phenomenological paradigms. It was anticipated that the phenomenological paradigm would lead to the development of theories on the determinants of Internet banking adoption in Ghana through the use of structured questionnaires in the empirical investigation stage. The positivistic approach centred on the testing of hypotheses as enumerated in Chapter One of this study. Finally, the adoption of the mixed research method was found to be suitable for this study as stated above.

The following subsections will detail this study's methodological design.

4.5.1 Population and sample selection

A population is the total of all the individuals who have certain characteristics and are of interest to a researcher (Crowther & Lancaster, 2008:57). Polit and Hungler (1999:37) refer to a population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. The two population groups for this study encompass all the banking clients in Ghana (both corporate and retail), and the CEOs, IT managers and customer service managers in all the banks in Ghana.

The sampling frame of a study according to Särndal, Swensson and Wretman (2003:24) is the source material or device from which a sample is drawn. It is a list of all those within a population who can be sampled and may include individuals, households or institutions. Many Ghanaian researchers find it difficult to acquire a sample frame for their research due to lack of available information and or errors in available data. This research is no different as the population of Internet banking customers are undefined. Thus, the complete population of banking clientele in Ghana could not be established for this study. Therefore the sampling frames for this study mirror the populations from which the samples were selected. This can be due to the vast number of banking clientele in Ghana. Lists of banking clients were not

available because of the confidentiality of information promised by banks to their clients as well as legal restrictions about divulging client information to a third party. Also, details of bank IT managers as well as CEOs could not be made available to the researcher.

Särndal, Swensson and Wretman (2003:25) define a sample is a subset of the population in a given research study. The reason why samples are important is that within many models of scientific research, it is impossible (from both a strategic and a resource perspective) to study all the members of a population for a research project. It is seen as very expensive and time-consuming (Crowther & Lancaster, 2008:58). Instead, a selected few participants who make up the sample are chosen to ensure that the sample is representative of the population. If this is the case, then the results from the sample can be inferred to the population, which is exactly the purpose of inferential statistics.

The sampling unit identified for the study comprised banking clients of 26 universal banks in Ghana, namely Stanbic, Unibank, UBA, Access, Fidelity, First Capital Plus, ICB, Guarantee Trust, Ecobank, Barclays, Standard Chartered, Universal Merchant, Zenith, Prudential, GN Bank, ADB, Bank of Baroda, Bank of Africa, CAL Bank, First Atlantic, NIB, Royal Bank, SG-SSB, HFC, Ghana Commercial Bank and UT Bank. An additional sampling group was made up of the CEOs, IT managers and customer service managers of these banks in Ghana.

Convenience sampling, is a non-probability sampling method that rely on data collection from population members who are easily accessible to participate in the study. It takes into consideration where the first available primary data source will be used for the research without additional requirements (Burns & Burns, 2008:203). This sampling technique has proven to be effective during the exploration stage of the research area. Another form of sampling that was used for this study is known as snowball sampling, which involves primary data sources nominating another potential

primary data source to be used in the research. This type has the advantage of recruiting hidden populations for a given research (Burns & Burns, 2008:206).

This research therefore makes use of both of these sampling methods to enable the researcher to make available the questionnaires to the banking clientele, CEOs, IT and customer service managers in order to ensure sufficient respondents for the study. From the convenient sampling as explained above, banking clients on the researcher's contact list were given the opportunity to participate in the first sample. Thereafter, IT and customer service managers who were conveniently located in various branches or head offices for the researcher to contact, and who were interested in participating in the research, were included as part of the second sample. The various CEOs or representatives of the banks were also contacted. The convenient sampling is to ensure that the largest possible outcome is derived from this research.

The adoption and use of snowball sampling is essential for this research because it embraces networking and uses the initial contact list to provide further contacts for the researcher who continuously monitored the response list of banking clients and IT managers. Since most of these respondents participated voluntarily, many more respondents were obtained through referrals from the earlier respondents.

From the above explanation, it is clear that no database with banking clientele information was available to enable the researcher to establish specific sample sizes. Therefore, the first samples selected for this study were all the banking clients who received a copy of the questionnaires and who wished to participate in the research being conducted. The study's second sample was made up of the IT managers, customer service managers and CEOs or representatives who wished to participate in the study.

4.5.2 Pilot study

The term “pilot study” is used in social science research to refer to a feasibility study which is a small-scale version or trial run of the major study, done in preparation for that study (Polit, Beck, & Hungler, 2001:467). A pilot study can also function as the pre-testing or “trying out” of a particular research instrument (Baker, 1994:182-183). One of the advantages of conducting a pilot study is that it might give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated. In the words of De Vaus (1993:54): "Do not take the risk, pilot test first.”

A pilot study was conducted to test the measuring instruments to ascertain whether the questionnaire items were homogeneous and would reflect the same underlying variables as depicted in the conceptual framework. The pre-testing was carried out on 15 banking clients to establish ease of understanding the questions, their relevance, how easily they could be answered as well as the timeframe to be used in conducting the research.

The 15 questions for the pilot study were subjected to a preliminary reliability assessment. The Cronbach’s alpha correlation coefficients were used to test the reliability estimates and also to get feedback from the experts to enable the researcher to makes changes to the original set of questionnaire items before finalisation. Hair et al. (1998:118) propose that the generally accepted lower limit for Cronbach’s alpha correlation coefficients is 0.70, while Malhotra (2006) suggests 0.60, especially when the research is exploratory.

It was expected that the results from the pilot study would not differ significantly from the lower limit of 0.70 stated in the Cronbach’s alpha correlation coefficients, in order for the researcher not to be required to make significant changes to the questionnaires for the study.

Thereafter, if changes to the questionnaires are made which will be acceptable to the lower limit of the Cronbach's alpha correlation coefficients, the two sets of questionnaires are administered to the respondents electronically and personally.

4.5.3 Data collection methods

For this study, both primary and secondary sources of data collection methods were used.

Secondary data source

Secondary data is data which has already been collected for purposes other than the problem at hand. It is easily accessible, relatively inexpensive and quickly obtained. It is rare, however, for this data source to provide all the answers to a non-routine research problem. It helps in diagnosing the research problem, developing an approach to the problem as well as developing the sampling plan of the study (Malhotra, & Birks, 2006:49).

The secondary source of data was used for the literature review (as detailed in Chapters One to Three) and was obtained through various national and international database searches conducted by the library of NMMU. These includes Emerald, EBSCO, Sabinet, SAE publications, ScienceDirect as well as Internet search engines such as Google and Google Scholar. Annual financial data from the Bank of Ghana was also used as part of the secondary sources. As noted in Chapter One, this research is unique since no similar study has been conducted in Ghana. The conceptual model was developed based on the knowledge gained from the secondary sources.

Primary sources

Malhotra and Birks (2006:94) explain that primary sources of data are originated by a researcher for the specific purpose of addressing the problem at hand. They are

individually tailored for the decision-makers of organisations who pay for well-focused and exclusive support. The authors state further that compared with readily available data from a variety of sources, this tailoring means higher costs and a longer time frame in collecting and analysing the data.

The primary study was conducted by means of two measuring instruments, namely structured questionnaires, one for the banking clientele and the other for IT managers, customer service managers and CEOs or their representatives. Use of questionnaires is one of the most popular primary data collection methods that involves respondents giving answers to a set of questions by choosing an option from the set of possible answers or providing their own answers for each question. Questionnaires can also ask respondents to rate or rank any given answers on the basis of provided measures (Collins & Hussey, 2003’4:173).

Brace (2008:4) defines the questionnaire as a medium of communication between researcher and respondent (interviewee). According to Monette, Sullivan, and DeJong (2005:164), the distinctive feature of questionnaires compared to other data collection methods is that they can be answered without assistance. Collis and Hussey (2003:173) observe that when using the quantitative approach, closed-ended questions must be used; conversely, open-ended questions must be used for the qualitative approach. Questionnaires can be written in various formats and can be based upon different circumstances. They can be in two formats: self-completion questionnaires and questions which are asked by someone (Monette, Sullivan & DeJong, 2005:165).

As indicated previously, two main measuring instruments were adopted for this study namely structured questionnaires. The questionnaires for the empirical investigation were developed in order to identify the possible influence of the selected variables on the determinants of Internet banking adoption in Ghanaian banks.

Secondary sources of data were used in the literature review aspect of this research, and these sources assisted in the development of the relevant questionnaire items for the study. Also, interviews were conducted with the various IT managers, customer service managers as well as the CEOs or representative of the various banks indicated in the sample frame, to aid the researcher in the development of the questionnaire items. One set of questionnaires was to be used to acquire the perceptions of 400 banking clientele while another set of questionnaires was used to acquire perceptions of 100 decision-makers of the banks. Each of the questionnaires included a cover letter explaining the objective and essence of the study being conducted as well as providing the potential respondents with instructions as to how these questions should be answered.

A questionnaire according to Brace (2008:25) can involve the researcher visiting respondents in their homes or workplaces. The advantage of this type of questionnaire is that there is more focus on the questions that can be derived from the respondents. However, it also has a range of disadvantages which include being time-consuming, more expensive and respondents may not wish to have the researcher in their houses or workplaces for various reasons. A computer questionnaire on the other hand (as discussed by Burns and Burns, 2008:497), requires respondents to answer the questionnaire which is sent by email. The advantages of the computer questionnaire include their inexpensive cost, time can be saved, and respondents do not feel pressured and therefore can answer when they have time, giving more accurate answers. However, the main shortcoming of the email questionnaires is that sometimes respondents do not bother answering them and they can just ignore the questionnaire (Brace, 2008:42).

This study also makes use of descriptive statistics because the questionnaire attempts to gather exact demographic information of the respondents. The questionnaire is descriptive as well as exploratory because the researcher’s intention is to identify relationships between the selected, independent, intervening and

dependent variables. This choice is supported by (Burns and Burns, 2008:485) who argued that an exploratory research questionnaire seeks to establish the cause and effect of relationships without any external manipulations.

The measuring instrument is made up of the nominal and interval scales. A nominal scale, as the name implies, is simply placing of data into categories without any order or structure. It is the lowest measurement level a researcher can use, from a statistical point of view. In research activities, a YES/NO scale is nominal. It has no order and there is no distance between YES and NO. It also allows the researcher to assign respondents to a certain category and allows data to be measured by assigning names to the data (Hair et al., 2003:154). In the case of banking clients, for example, “gender” can be assigned to a category due to the fact that the customers are made up of both male and the female gender. Interval scales, on the other hand, are scales which are defined by metrics such as logarithms. In these cases, the distances are not equal but they are strictly definable based on the metric used. It is an interval scale because it is assumed to have equidistant points between each of the scale elements. This means that researchers can interpret differences in the distance along the scale.

The interval scale for this study ranged from “strongly disagree” to “strongly agree” on a 7-point Likert scale. This interval allowed the researcher to perform arithmetical operations on the data in the statistical analysis (Sekaran, 2000:187). It also allowed for more statistical procedures to be conducted. It has the ability to use numbers to rate objects or events so that the distances between the numbers are equal.

The questionnaires in this study consist of three sections. Section One gathers information on Internet usage and banking habits of the respondents. Section Two consists of respondents’ views on their feelings towards the Internet and their perception of using Internet banking services. Section Three gathers demographic information. The items on the questionnaires are mostly closed-ended questions with very few open-ended options.

4.6 DATA ANALYSIS METHODS

It is essential to note that the models to be tested undergo the data analysis procedure in this study. This includes independent, intervening and dependent variables. A dependent variable refers to the variable being predicted or estimated, whereas the independent variable provides the basis for the estimation of the dependent variable (Russell & Purchell, 2009:8). Thus, the dependent variable is the primary or main interest of the researcher while the independent variable is the variable that influences the dependent variable in either a positive or negative way (Sekaran, 2000:92). Also, the intervening variables provide the link between the independent variable and the dependent variable and indicate the manner in which the independent variable produces the effect on the dependent variable.

This study's conceptual model includes seven independent variables and one dependent variable. The data analysis procedure described in this section, results in the calculation of descriptive statistics as well as inferential statistics. Descriptive statistics is the term given to the analysis of data that helps to describe, show or summarise data in a meaningful way so that patterns might emerge from the data. Descriptive statistics do not, however, allow the researcher to make conclusions beyond that which has been analysed or reach conclusions regarding any hypotheses that might have been made (Malhotra, 2006). They are simply a way to describe the data.

Descriptive statistics are important in a study, because if the researcher simply presented raw data, it would be difficult to visualise what the data was showing, especially when there is a significant amount of data. Descriptive statistics therefore enable the researcher to present the data in a more meaningful way, which allows for simpler interpretation of the data. Inferential statistics are techniques that allow the researcher to use these samples to make generalisations about the populations from which the samples were drawn (Malhotra, 2006). It is, therefore, important to confirm that the sample accurately represents the population.

The statistical analysis of the quantitative data for this study comprised six distinct phases. First, structural equation modelling (SEM) was conducted in order to measure the goodness-fit of the data to the model. SEM was used to examine a series of interrelated dependence relationships simultaneously, for the testing and estimation of relationships between the independent, intervening and dependent variables (Hair, Black, Babin & Anderson, 2010:610). Here, five indices were used to evaluate the goodness-of-fit. Also, as part of the SEM process, the data was subjected to a confirmatory factor analysis (CFA) to identify the validity of the measuring instrument. The second phase involved the evaluation of its construct validity. This included determining the measuring instruments' convergent, discriminant, nomological and face (or content) validity (Hair et al., 2010:771). The third phase was testing the reliability of the measuring instrument through the adoption of construct reliability function and the Cronbach's alpha correlation coefficients (Leedy & Ormrod, 2005:26-27). The fourth data analysis phase considered the hypothesised relationships. The point and interval estimates of the parameters obtained from the SEM procedure were used to test the hypotheses. The fifth stage involved the computation of various descriptive statistics such as the mean, and frequency distribution to summarise the sample data (Zikmund, 2000:436). The last and final stage involved a comparison between the responses of the banking clients and the banking staffs. This analysis stage made use of SPSS AMOS 22 data analysis software to perform the analysis.

4.6.1 SEM to evaluate model fit

SEM is the main statistical analysis technique that was adopted for the empirical investigation for this study. Hair et al. (2010:629-630) indicate that SEM is a multivariate technique used by a researcher to expand the researcher's explanatory ability. It is an extension of other models such as factor analysis and multiple regression analysis. It examines a series of dependent relationship simultaneously and is very useful for testing theories that contain multiple equations involving

dependence relationships (Hair et al., 2010:711). Thus, a hypothesised dependent variable becomes an independent variable in a subsequent dependence relationship.

Kaplan (2000:1) defines SEM as “a class of methodologies that seeks to represent hypotheses about the means, variances and covariance’s of observed data in terms of a smaller number of ‘structural’ parameters defined by a hypothesized underlying model”. SEM is also very flexible, because it deals not only with a single simple or multiple linear regressions, but with a system of regression equations (Hair et al., 2010:723). Its most prominent feature is the capability to deal with latent variables, in other words, non-observable quantities like true-score variables or factors underlying observed variables (Kline, 1998:16). Latent variables are connected to observable variables by a measurement model (Edwards & Bagozzi, 2000:157). SEMs therefore consist of a structural model representing the relationship between the latent variables of interest, and measurement models representing the relationship between the latent variables and their manifest or observable indicators (Kline, 1998:19).

The main feature of a SEM is to compare the model to empirical data. This comparison leads to the goodness-fit statistics assessing the matching of model and data. If the fit is acceptable, the assumed relationships between latent and observed variables (measurement models) as well as the assumed dependencies between the various latent variables (structural model) are regarded as being supported by the data (Hair et al., 2010:663). In this case, a SEM is a CFA model. The possibility of modelling complex dependencies and latent variables is regarded as being the main advantages as well as the main reason to use SEM. Hair et al. (2010:672) further state that SEM enables the analysis of latent variables and their relationships, offering the opportunity to analyse the dependencies of psychological constructs without measurement errors. This means that SEM will allow the researcher to access the quality of the measurement in the conceptual model and the relationships between the variables.

Hair et al. (2010:665) indicate that the use of goodness-of-fit in SEM compares theory to reality by assessing the similarity of the estimated covariance matrix (theory) to reality (the observed covariance matrix). Hence, the goodness-of-fit in this study is to determine the extent to which SEM models fit with the sample data or how well the literature fits reality as presented by the empirical investigation data. Hair et al. (2010:731) further argue that for a good adoption of SEM, at least three indices of the goodness-of-fit should be adopted from the different categories so as to reflect the diverse criteria of the study. For this research, the various indices are presented in Table 4.4 below.

Table 4.4: Goodness-of-fit indices for SEM

Index	Required value	Goodness-of-fit category
Normed chi-square (x^2/df)	$x^2/df \leq 3$	Basic fit measure
Root mean squared error of approximation (RMSEA)	RMSEA < 0.07	Absolute fit
Comparative fit index (CFI)	CFI > 0.9	Incremental fit index
Tucker-Lewis index (TLI)	TLI > 0.9	Incremental fit index
Parsimony goodness-of-fit index (PGFI)	A better model has a higher PGFI	Parsimony fit index

Source: Hair et al. (2010)

Hair et al. (2010:672) conclude that the fact that the researcher has achieved the goodness-of-fit with the SEM model does not confirm the proposed model since other statically model can also achieve the fit.

4.7 VALIDITY AND RELIABILITY OF THE STUDY

4.7.1 Validity of the study

Research validity relates to the extent to which the survey measures the right elements that need to be measured. In simple terms, validity refers to how well an instrument measures what it is intended to measure (Pelissier, 2008:12). Research validity can be divided into two groups: internal and external. It can be specified that “internal validity refers to how the research findings match reality, while external validity refers to the extent to which the research findings can be replicated to other environments” (Pelissier, 2008:12). As indicated earlier, the CFA was one of the indicators used to determine the construct validity of the study. The construct validity was confirmed by taking into consideration convergent, discriminant, nomological and face validity (Hair et al., 2010:709).

Face validity is the most basic type of validity and it is associated with the highest level of subjectivity because it is not based on any scientific approach. In other words, in this case a test may be specified as valid by a researcher because it may seem valid, without an in-depth scientific justification (Pelissier, 2008:14).

Convergent validity involves the degree to which individual items reflect a construct converge in comparison to items measuring different constructs. A commonly applied criterion of convergent validity is the average variance extracted (AVE) proposed by Fornell and Larcker (1981:45). An AVE value of at least .500 indicates that the measuring instrument is on average able to explain more than half of the variance of its indicators and thus demonstrates sufficient convergent validity.

Discriminant validity concerns the degree to which the measures of different constructs differ from one another. Whereas convergent validity tests whether a particular item measures the construct it is supposed to measure, discriminant validity tests whether the items do not unintentionally measure something else. In SEM, two measures of discriminant validity are commonly used. For the first measure, cross-loadings are obtained by correlating each LV's component scores with all the other items (Chin, 1998). If each indicator's loading is higher for its designated construct than for any of the other constructs, and each of the constructs loads highest with its assigned items, it can be inferred that the different constructs' indicators are not interchangeable. The second measure, the Fornell–Larcker criterion (Fornell and Larcker, (1981:47) requires an LV to share more variance with its assigned indicators than with any other LV. Accordingly, the AVE of each LV should be greater than the LV's highest squared correlation with any other LV.

Nomological validity occurs where within a net of hypotheses, the formative construct behaves as expected. Accordingly, those relationships between the formative construct and other models' constructs, which have been sufficiently referred to in prior literature, should be strong and significant (Henseler et al., 2009:4l).

With regard to establishing the face validity of this study, two experts in the area of marketing and statistics were consulted to review the questionnaire used. Here, they were given the variable definitions of the different factors and the conceptual models and tasked to evaluate whether the items of the measuring instruments were relevant, necessary, meaningful and correctly worded for the study. The initial pilot study was another form of face validation.

Factor analysis is a multivariate analysis procedure that attempts to identify any underlying factors that are responsible for the covariance among group independent variables. The goal of factor analysis is typically to reduce the number of variables used to explain a relationship or to determine which variables show a relationship. The factor analysis takes two forms, namely exploratory and confirmatory.

Exploratory factor analysis explores the loading of variables to try to achieve the best model. Thus it entails putting variables in a model where it expected they will group together and then seeing how the factor analysis groups them. This type is specifically considered to be a data reduction procedure. The objective of exploratory factor analysis is to establish whether the measurement items converge to the corresponding constructs (factors), whether each item loads with a high coefficient on only one factor, and that this factor is the same for all items that are supposed to measure it. The number of selected factors is determined by the numbers of factors with an Eigen value exceeding 1.0. An item loading is usually considered high if the loading coefficient is above .600 and considered low if the coefficient is below .400 (Gefen & Straub, 2005:28). Confirmatory factor analysis on the other hand, is the confirmation of the previously defined hypotheses concerning the relations between variables.

It was found that a combination of both analyses would be ideal for the study. As indicated earlier, the CFA was used to establish if the identified variables loaded as predicted on the pre-selected number of factors. The CFA attempted to confirm theoretical predictions as it tested whether a specific set of factors is influencing responses in a predicted manner. Furthermore, the CFA helped to ascertain whether the loading of the measured variables conform to what is expected on the basis of the literature overview on the determinants of Internet banking. The CFA confirmed the factor loading on the pre-selected factors to indicate proof of convergent validity.

4.7.2 Reliability of the study

“Reliability refers to whether or not you get the same answer by using an instrument to measure something more than once” (Bernard, 2011:42). Thus, research reliability is the degree to which research method produces stable and consistent results. A specific measure is considered to be reliable if its application on the same object of measurement a number of times produces the same results. Burns and Burns

(2008:410) further state that reliability is concerned with the consistency, stability and credibility of a study's findings which enable the findings to be reproduced. For this study, the reliability of the measuring instruments are considered by evaluating the CR function.

The traditional criterion for assessing internal consistency reliability is Cronbach's alpha correlation coefficient, where a high alpha value assumes that the scores of all items with one construct have the same range and meaning (Cronbach, 1951). An alternative measure to Cronbach's alpha is the composite reliability (Werts et al., 1974). Chin (1998:323) recommends composite reliability as a measure, since it overcomes some of the deficiencies of Cronbach's alpha. Cronbach's alpha assumes that all indicators are equally reliable; therefore, it tends to severely underestimate the internal consistency reliability of LVs SEMs. In contrast, composite reliability takes into account that indicators have different loadings (Henseler et al., 2009:299). Regardless of which coefficient is used for assessing internal consistency, values above 0.7 are desirable for exploratory research and values above 0.8 or 0.9 in more advanced stages of research, whereas values below 0.6 indicate a lack of reliability (Nunnally & Bernstein, 1994:264-265). However, levels above 0.95 "are more suspect than those in the middle alpha ranges" (Straub et al., 2004:401), indicating potential common method bias.

Chin (1998:320) states that indicator reliability describes the extent to which a variable or set of variables is consistent regarding what it intends to measure. The reliability of one construct is independent of and calculated separately from that of other constructs. He infers that the researcher can monitor reflective indicators' loadings to assess indicator reliability. Generally, Chin (1998:324) postulates that an LV should explain at least 50 per cent of each indicator's variance. Accordingly, indicator loadings should be significant at least at the 0.050 level and greater than 0.707 (≈ 0.500). However, with the exception of exploratory research designs where some authors recommend lower threshold values like 0.500 (Straub, 1989), 0.450

(Lewis et al., 1995:210), There may be various reasons for these requirements not being fulfilled: (1) the item is simply unreliable; (2) the item may be influenced by additional factors, such as a method and (3) the construct itself is multi-volume dimensional in character and thus items are capturing different issues (Chin, 1998:325).

Generalisability of the findings of the study will also be taken into consideration. This refers to the scope of applicability of a study from one environment to other settings (Sekaran, 2000:24) and to the extent to which this study's results can apply to cases or situations beyond those in this particular study. The questionnaires of this study were distributed both electronically and face-to-face to various banking clients and IT managers as well as CEOs with responses gathered through the use of convenience snowball sampling in Ghana. Therefore, this study can be said to be generalised due to the two viewpoints of the respondents.

4.7.3 Testing of hypotheses

An acceptable model fit as determined by SEM will not be enough to support the proposed structural theory. The estimated parameters that represent the various hypotheses must also be evaluated. A conceptual model is supported and considered valid to the extent that the parameter estimates are statistically significant and in the predicted direction (Hair et al., 2006:758). Therefore, in order to test the stated hypotheses of this study, the estimated parameters were obtained from the SEM process and examined during the fourth phase of the data analysis procedure. During this phase, the researcher was able to compute the variability observed in the data. Also, the coefficient of determination R^2, determined the percentage of the variations in the independent variable and the independent variable. This coefficient can vary between 0 and 1 and can also be converted into percentages (Hair et al., 1998:143).

4.7.4 Comparison between clients and bank staff

Lastly, comparisons were made between the responses of the banking clientele, and IT and customer service managers and CEOs. The researcher conducted SEM analysis for the banking staff dataset by imposing the same structure or model that resulted from the banking clientele analysis on the bank to determine whether or not the data fits the model adequately. To test the second set of hypotheses of this study, the estimated parameters that were obtained from the banking IT and customer service managers' SEM processes, were examined to identify significant relationships between factors in the model based on the managers' perceptions. The mean score of each factor of the banks' IT managers were also compared to the score of the banking clientele to identify differences between the two groups' levels of agreement on the determinants of Internet banking factors on adoption.

4.8 SUMMARY

This methodology chapter provided a discussion of the various research designs and methodology for the study. The discussion takes various issues into consideration such as various approaches to the research design, data collection methods and sampling measurements instruments as well as the data analysis process followed in the empirical investigation. It is therefore evident that this research has employed a vigorous research design coupled with two sets of well-structured questionnaires. Relevant secondary sources have been consulted and the measuring instruments have been well-constructed. Most importantly, this chapter demonstrates that the appropriate data analysis method has been selected for the empirical study. Following this broad research methodology, the next chapter will present the empirical results of the data analysis procedures.

CHAPTER FIVE
EMPIRICAL FINDINGS

5.1 INTRODUCTION

This chapter presents the results and discussions of the secondary research objectives of the study. In order to report these accurately, the chapter commences with a brief summary of the objectives of the empirical investigations and the conceptual model to be tested as stated in Chapter One. Results of the validity and reliability testing of the measuring instruments are presented together with the hypotheses testing and the SEM goodness-of-fit results. The chapter concludes with a comparison between the responses of banking clients and the bank managers.

5.2 SUMMARY OF EMPIRICAL INVESTIGATION OBJECTIVES

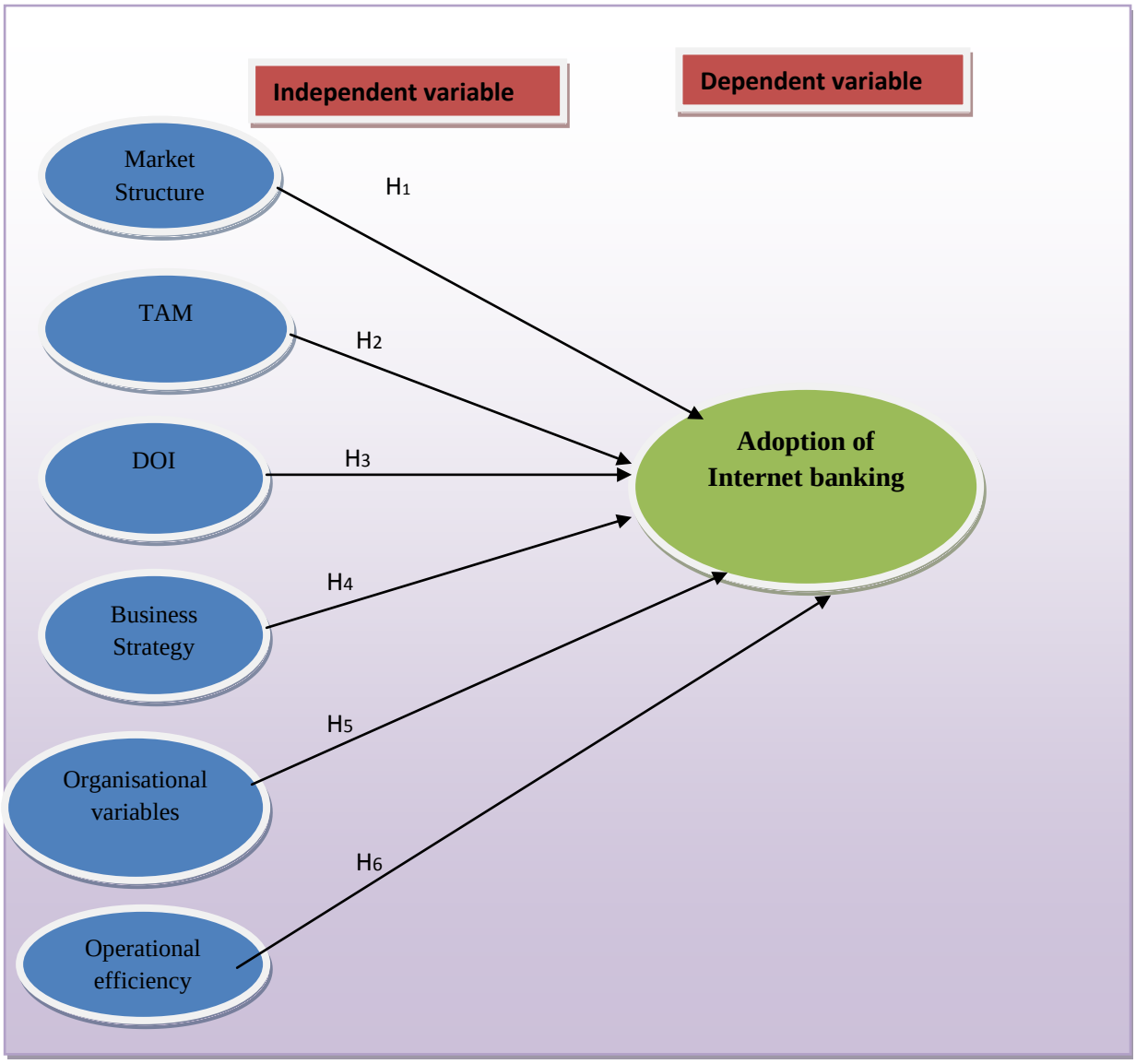
To be able to empirically test the conceptual model pertaining to the factors that determine the adoption of Internet banking in Ghana, a number of hypotheses were propounded in Chapter One of this study as per Table 1.1 and Figure 1.3.2. These are reproduced below as Table 5.1 and Figure 5.1 to facilitate ease of reference. The hypotheses state that there is a direct relationship between the variables identified.

Table 5.1: Research hypotheses

Hypothesis	Description
H1	A bank with a larger market share has an influence on the adoption of Internet banking
H2	A bank's perceived way of accepting technology has an influence on the adoption of Internet banking
H3	A bank's diffusion of innovation variables has an influence on the adoption of Internet banking

Hypothesis	Description
H4	A bank's business strategy (deposit) has an influence on the adoption of Internet banking
H5	A bank's organisational variables have an influence on the intention to adopt Internet banking
H6	A bank's operational efficiency has an influence on the adoption of Internet banking

Figure 5.1: Conceptual model



These sets of hypotheses were empirically tested as described in Chapter Four. The following section provides the data analysis results from the investigations.

5.3 DATA ANALYSIS RESULTS

The research model as presented in Figure 5.1 implemented as a SEM through SPSS AMOS 22.0. This model is tested with numerical data obtained from the banking clients' surveys. The data was collected from customers (N=401) of banking clients in Greater Accra, Eastern and Ashanti regions of Ghana as well as bank managers (N=100) in these geographical locations during 2014. Since the questionnaires are the same (one from the customer's perspective and the other from the bank's perspective), only one set of questionnaires will undergo the SEM goodness-of-fit evaluation.

The survey was conducted using a Likert-based questionnaire ranging from 1= strongly disagree to 7= strongly agree. Questions were both positively and negatively worded and before the completion of each questionnaire, the researcher clarified the objectives of the study to respondents. The respondents were selected using the judgmental sampling method because banks are not providing customers' names and information due to legal restrictions.

The data analysis comprises six main segments and the empirical discussion will be similarly presented. Initially, various descriptive statistics such as the mean and frequency distributions were used to summarise the sample data, whereas determining the reliability of the measuring instrument made up the third phase of the process. Here, these instruments were tested through the construct reliability (CR) measure as well as the computation of Cronbach's alpha correlation coefficients. In the third phase, the validity of the measuring instrument was considered by the evaluation of its construct validity, which includes determining its convergent discriminant, nomological and face validity. The validity was then verified by means

of considering the factor loadings in the CFA, the VE measure as well as the comparison of the factors VE figures with the squared correlations between factors.

SEM was performed during the fourth stage of the process to specify the causal relationships among the latent variables, describes the causal effects and unexplained variance. SEM was conducted in order to measure the goodness-of-fit of the data to the model. Five indices, namely the normed chi-square (x^2/df), RMSEA, CFI, TLI and PGFI were used to appraise the model's goodness-of-fit. During this stage, comparisons were made between the perceptions of banking clients and managers on Internet banking adoption determinants. This was done by comparing the banking clients' model with the bank managers' dataset by comparing the parameter estimates to test hypotheses and by comparing the mean score of clients and managers.

In the final stage of testing, the hypothesised relationship from evaluating the point and interval estimates of the parameters provided during the SEM procedures was carried out. This presupposes that the researcher has the ability to reject or accept hypotheses based on the results from the SEM procedure.

The following abbreviations were used in the various figures and tables and are presented in the table below for easy referencing and identification.

Table 5.2: Research factors and their abbreviations

Factor	Abbreviation
Market share	MS
Technology acceptance	TECH
Business strategy	BS

Diffusion of innovation	DOI
Operational efficiency	OE
Organisational variables	OV

The following sections will address the descriptive statistics of the study.

5.4 DESCRIPTIVE STATISTICS OF BANKING CLIENTS AND EXECUTIVE RESPONDENTS

Tables 5.3 and 5.4 provide summaries of demographic information relating to the respondents to the two questionnaire categories of banking customers and banking executives respectively.

Table 5.3: Demographic information: banking clients

Variable	Response	Frequency	Percentage
Gender	Male	249	62.09
	Female	152	37.91
Age	Under 20	16	3.99
	20–29	196	48.88
	30–39	167	41.65
	40–49	9	2.24
	50–59	2	0.5
	60+	11	2.74
Highest education level	Primary school	13	3.24
	Junior high school	27	6.73

	Senior high school	80	19.95
	Polytechnic	105	26.18
	Bachelor's degree	135	33.67
	Master's degree	37	9.23
	Doctorate	4	1
Current profession	Student	114	28.43
	Professional	47	11.72
	Self-employed	85	21.2
	Manager	101	25.19
	Executive	38	9.48
	Technician	5	1.25
	Retiree housewife	11	2.74

The table above depicts a total of 401 responses to the questionnaire. Of this number, male respondents were in the majority (n=249) representing 62.09 per cent of the total population, while female respondents (n=152) represented 37.91 per cent. This appears to confirm the assertion that males dominate the use of technology especially the Internet. In terms of the age category, most respondents fell into the middle category of the banking population who are also classified as dominants users of the Internet. These age groups are 20 to 29 (n=196, 48.88%), 30 to 39 (n=167, 41.65%) and 40 to 49 (n=9, 2.24%). Banking clients in this category form more than 90 per cent of the total population selected. Those older or much younger who are between ages of 20 and 29 and over 50 accounted for less than 10 per cent of the total respondents.

It is also important to point out that most of these respondents possess tertiary education from the polytechnic level to a doctorate (n=281) representing 70.08 per

cent of the total sample population used. However, respondents at senior high school level formed 19.95 per cent of the responses (n=80) who may be classified as having some level of appreciation and understanding of technology. Students (n=114, 28.43%), managers (n=101, 25.19%), professionals (n=47, 11.72) and executives (n=38, 9.48) dominated the respondents. These respondents have a very high level of Internet usage and appreciation for technology.

As recommended by the two experts consulted for this study, the sample sizes used were reasonable for the statistical data analysis and procedures selected.

Table 5.4: Demographic information: banking executives

Variable	Response	Frequency	Percentage)
Gender	Male	76	76
	Female	24	24
Age	20–29	12	12
	30–39	55	55
	40–49	33	33
Highest education level	Bachelor’s degree	9	9
	Master’s degree	71	71
	Doctorate	20	20
Years in current jobs	0–2	59	59
	3–5	41	41

In terms of the responses from the banking executive perspective shown in Table 5.4 above, the male population dominated the survey with a total number of 76 out of the overall sample size of 100, with females accounting for the remaining 24. Executives within the age brackets of 30 to 39 (n=55) dominated the respondents, followed by

ages of 40 to 49 (n=33). It is important to note that all executives have a tertiary level of education ranging from a bachelor's degree to a doctorate. This class of professionals has a very high understanding of the importance of technology and tend to understand the banking needs of their customers. These banking executives have spent an average of five years with their current employer. This can be attributed to the high rate of staff turnover in the banks partly due to expansion in the financial system and opening of new branches by the banks.

The standard deviations and mean scores were also determined from the sample respondents regarding the determinants of Internet banking in Ghana to evaluate the degree of agreement or disagreement as well as the degree of dispersion around the mean. Table 5.5 presents the results of this analysis.

Table 5.5: Standard deviation and mean score of factors

Factors	Mean	Standard deviation
BS	3.91	1.432
DOI	5.22	1.021
MS	3.78	1.256
OE	3.97	1.248
OV	4.64	1.269
TECH	5.04	1.323
Internet banking	4.08	1.29
Internet banking adoption	4.12	1.14

From the results above, DOI attained the highest mean score of 5.22 followed by TECH with a score of 5.04 and OV at 4.64. This shows that the respondents were of the view that the process of DOI by their banks is of paramount importance to them followed by the acceptance of technology. Some were neutral about the banks' MS, BS and OE; however, these slightly leaned towards strongly agreeing with adoption.

The standard deviation scores depicted above also show that the respondents varied with regard to their viewpoints on the determinants of Internet banking adoption. For instance, BS obtained the highest standard deviation of 1.432 while DOI obtained the lowest with a score of 1.021. This means that respondents share similar views regarding BS but differ on the DOI viewpoint.

Table 5.6: Influence of demographic characteristics on Internet banking adoption

Independent factors: Internet banking		
Demographic characteristics	**Mean score**	**Significance level**
Gender	5.821	0.044
Age	5.304	0.001
Highest education	4.14	0.005
Current occupation	5.382	0
Average monthly income	4.241	0.002

The mean difference is significant at the 0.05 level

The descriptive statistics of the data focus on how these demographic variables influence the dependent factor. Post-hoc Bonferroni testing allowed the researcher to compute multiple comparisons between means of a factor for the dependent variable. The test reveals that, at the 0.05 significance level (p=0.044), the mean score of 2.506 adherence to the policy if the respondents are male. The test statistics of 9.1

significant at 0.05 and p-value of 0.00 for age indicates that respondents between the ages of 20 and 29 are more likely to endorse the variable. With regard to education, the test reveals that, at the 0.05 significance level (p=0.000), the test statistics of 16.115 show that more respondents had polytechnic qualification and are skewed towards accepting Internet banking than any other form of education. There appeared significantly higher test statistics for the remaining variables like current occupation and average monthly income. This suggests that more respondents with professional background and who earn between 1,000 and 1,999 Ghana Cedis (GHS) are more positive about adopting Internet banking.

Table 5.7: Test of means between domestic and foreign banks for Internet banking

Profitability Ratios	Performance 2012				△ Performance (2012-2013)		
	(1)Domestically controlled banks [low e-banking]	(2)Foreign controlled banks [High e-banking]	Mean Difference [2] – [1]		(3)Domestically controlled banks [low e-banking]	(4)Foreign controlled banks [High e-banking]	Mean Difference [4] – [3]
Return On Equity (%)	14.92	21.65	+6.73		5.37	3.78	1.59
Return On Assets (%)	2.82	5.35	+2.63***		0.65	-1.68	-2.33
Return on Earning Assets (%)	3.41	7.16	+3.76**		0.57	1.53	0.96*
Interest Margin (%)	9.18	10.81	+1.63*		-0.06	1.64	1.70**
Expense Income (old)	80.95	62.76	-18.18		-5.12	-5.39	-0.27
Expense Income (new)	64.30	49.00	-15.29***		-5.26	-4.34	0.91
Percentage Interest Payable	8.02	5.42	-2.60**		0.61	-0.32	-0.93
Gross Yield (%)	16.58	15.02	-1.56		0.07	1.98	1.91**
Net Interest Spread (%)	8.55	9.26	0.71		0.53	2.43	2.96***

Table 5.7 presents two interesting results. The first is the differences in performance of banks with respect to Internet banking in 2012 and the second reports how the presence of Internet banking has possibly affected the difference in performance between 2011 and 2012 for the two categories. Comparing the results in 2012 to those of 2011 indicates that there is no significant difference between the two streams of banks with respect to Internet banking, while returns of assets for the two streams of banks continue to be different. Whereas returns on earnings assets are 2.82 per cent for domestic banks, they are 5.35 per cent for foreign banks which use the higher level of Internet banking. On the returns on earning assets, the foreign banks have an edge over domestic banks, all things being equal.

Returns on earning assets for domestic banks are 3.41 per cent while they are higher for the foreign banks at a rate of 7.16 per cent for the year 2012. Similar to 2011, the interest margin was higher for the foreign banks than domestic banks. While foreign banks had an interest margin of 10.81 per cent, the domestic banks had an interest margin of 9.18 per cent. With respect to expense income (old), there was a significant difference between the two types of bank. While expense income (old) is 80.95 for the domestic banks, it was significantly lower at 62.76 for the foreign banks. Expense income (new) was significant with the domestic banks obtaining an average of 64.30 and the foreign banks obtaining an average of 49.0.

The overall significant differences between 2011 and 2012 reduced, which could mean the ideal of differences in domestic banks and foreign banks with respect to Internet banking may have reduced.

Interestingly, only four profitability indicators were significant with respect to the change in performance between year 2011 and year 2012. These profitability indicators were returns on earning assets, interest margin, gross yield and net interest spread. For returns on earnings assets, while the change for domestic banks was 0.57 on the average, that of foreign banks was 1.57 on average, meaning the foreign banks improved when compared to the local banks. With the interest margin,

the average change of the domestic banks was -0.06 while that of foreign banks was 1.64, meaning that foreign banks still improved more than the domestic banks. With gross yield, the domestic banks had an average change of 0.07 while the foreign banks had an average change of 1.98 which was more of an improvement. Net interest spread was 2.43 average change for domestic banks, but 2.96 on average for foreign banks – which still indicates a substantial improvement in the foreign banks compared to the local banks. This may be due to the fact that the foreign banks were more involved in Internet banking and therefore had an advantage over the period, although the domestic banks showed some improvement in 2012.

The variable with the lowest impact on the determination of Internet banking adoption in Ghana is the business strategy adopted by these banks. This stems from the fact that products are now seen as commodities by the customers and that strategy developed by one bank may be easily imitated by others. Therefore, deploying Internet banking, especially by the foreign-controlled banks is easily imitated by the local banks.

5.4 VALIDITY OF THE MEASURING INSTRUMENT

As stated in Chapter Four of this study, construct validity is the appropriateness of inferences made on the basis of observations or measurements (often test scores), specifically to see whether a test measures the intended construct. Constructs are abstractions that are deliberately created by researchers in order to conceptualise the latent variable, which is the cause of scores on a given measure (although it is not directly observable). Construct validity examines the question: Does the measure behave like the theory says a measure of that construct should behave? This question is essential to the perceived overall validity of the test. The construct validity used in confirming the study took into consideration the following: convergent, discriminant, nomological and face validity.

5.4.1 Convergent validity

Convergent validity is the extent to which scale correlates positively with other measures of the same construct. It involves the degree to which individual items reflecting a construct, converge in comparison to items measuring different constructs. Thus, the specific measuring factors should converge, share a high proportion of variance or be related. In order to test the converge validity of the measuring instrument of this study, all the factor loading must statistically be significant in the study. Therefore, as depicted by the p-values in Table 5.8 below, all the factor loadings were statistically significant. Again, it is important to confirm the convergent validity through standardised loading factors which should be a minimum of 0.5 of higher.

Table 5.8 shows the factor loading of all the items of the measuring instrument.

Table 5.8: Factor loadings

			Factor loadings
TECH7	<---	TECH	0.786
TECH6	<---	TECH	0.296
TECH5	<---	TECH	0.922
TECH4	<---	TECH	0.843
TECH3	<---	TECH	0.695
TECH2	<---	TECH	0.853
TECH1	<---	TECH	0.881
OV1	<---	OV	0.598
OV2	<---	OV	0.858
OV3	<---	OV	0.160
OV4	<---	OV	0.681
OV5	<---	OV	0.731
OV6	<---	OV	0.611
OV7	<---	OV	0.471
BS4	<---	BS	0.738
BS3	<---	BS	0.549
BS1	<---	BS	0.645
OE1	<---	OE	0.588

			Factor loadings
OE2	<---	OE	0.628
OE3	<---	OE	0.731
OE4	<---	OE	0.948
OE5	<---	OE	0.882
OE6	<---	OE	0.715
OE7	<---	OE	0.772
OE8	<---	OE	0.596
OE9	<---	OE	0.774
DOI9	<---	DOI	0.296
DOI8	<---	DOI	0.554
DOI7	<---	DOI	0.901
DOI6	<---	DOI	0.888
DOI5	<---	DOI	0.654
DOI4	<---	DOI	0.551
DOI3	<---	DOI	0.637
DOI2	<---	DOI	0.752
DOI1	<---	DOI	0.580
MS1	<---	MS	0.756
MS2	<---	MS	0.716
MS3	<---	MS	0.599

The table above shows that not all of the item loadings exceeded the threshold of 0.50 required. For instance, TAM, depicted as TECH 6 had a value of less than 0.50 (TECH 6=0.296). With the organisational variable, two items scored below the required minimum level (OV3=0.160 and OV7=0.471). For DOI, one of the items fell below the required level and is shown as DOI9=0.296.

Even though some of the items did not meet the threshold of 0.50 (TECH 6=0.296, OV3=0.160 and OV7=0.471 and DOI9=0.296), on average, most of the variables were above 0.50 and it can be concluded that the results of the factor loading are accepted. Thus the model fit of SEM is acceptable and it confirms the convergent validity of the measuring instrument.

In order to confirm the ultimate assessment of the convergent validity of the measuring instrument used for the study as stated in the previous chapter, the VE is

a good indicator. The VE is thus the average squared factor loading; a VE of 0.50 or higher shows adequate evidence of convergence validity. Table 5.9 depicts the VE of each of the factors from the study.

Table 5.9: VE Values of all factors

Factors	VE
MS	0.572
DOI	0.636
OE	0.745
BS	0.516
OV	0.657
TECH	0.777
RM	0.615
CR	0.559

From these VE results, it can be seen that all the variables showed a VE of more than the threshold of 0.50. This results support the assertion of the convergence validity of the measuring instrument used for this study.

5.4.2 Discriminant validity

Discriminant validity concerns the degree to which the measures of different constructs differ from one another. Accordingly, the AVE of each LV should be greater than the LV's highest squared correlation with any other LV. Therefore, in order to authenticate the discriminant validity of this study's measuring instrument,

the VE percentages for any two factors were compared with the correlation estimates between the two factors. The result criteria recommend that if VE > squared correlation, discriminant validity is good.

Table 5.10: VE versus squared correlation estimates

1	2	3	4	5	6	7	8
Factor	**VE**	**MS**	**DOI**	**OE**	**BS**	**OV**	**TECH**
MS	0.572	1.38	0.17	0.01	0.49	0.23	0.09
DOI	0.636		1.04	0.24	0.45	0.36	0.55
OE	0.745			1.55	0.1	0.67	0.45
BS	0.516				2.04	0.1	0.15
OV	0.657					1.61	0.48
TECH	0.777						1.75

The table above ranges from one to eight with factors considered shown in Column 1 and VE in Column 2 and each respective factor from Column 3 to Column 8. Table 5.10 shows that most of the VE are greater than the compared squared correlations. This therefore means that discriminant validity can be confirmed for the measuring instrument adopted for this study.

5.4.3 Nomological validity

Nomological validity occurs where, within a set of hypotheses, the formative construct behaves as expected. Accordingly, those relationships between the formative construct and other models' constructs which have been sufficiently

referred to in prior literature, should be strong and significant. For instance, in this study, nomological validity will show if there is a reasonable expectation that DOI is correlated to OV.

Table 5.11 depicts some possible reasons for the cross-correlations between the different factors, as given by the MI results from Table 5.10 above.

Table 5.11: Possible reasons for cross-correlations between factors

Cross-correlation	Possible reason for correlation between factors
MS and DOI	The market share of a bank in a given market may be influenced by how far and appropriate the bank has deployed its technology and other innovations to customers.
DOI and OE	The deployment of innovation and technology by a bank to its clients may be influenced by how efficient and effective the bank's operations are in the market to enable customers adopts these innovations.
MS and BS	The market share that a bank may possess in a given market may be highly influenced by the business strategy that the bank has adopted to maintain existing as well as attract new customers.
DOI and BS	The bank method of diffusing innovation either new or existing to its customers may be deemed for effective taking into consideration the business strategy that it adopts.
OV and TECH	Bank customers may adopt or accept new technology such as the Internet banking platform due to the organisational variables that may influence the customer in accepting the

	technology.
BS and OV	The business strategy adopted by an individual bank may be due to the organisational variables that the bank has.
OE and OV	The effectives of an individual bank may be characterised by the organisational variables being employed by the individual bank.
OE and TECH	The clients of an individual bank may adopt technology very fast depending on the operational efficiencies being deployed by the bank to aid these customers in embracing technology which hitherto they were not willing initially.
DOI and TECH	An individual bank's customer adopting of innovation or otherwise may largely depend on the technology being deployed and how and why these technologies are deployed.

These suggestions can be corroborated from theory to support the arguments indicated. With the exception of some of the explanations and reasoning above, each of these possible correlations have also been discussed in the various chapters in this study. Therefore, the nomological validity of this study can be noted.

5.4.4 Face validity

In Chapters One and Four of this study, this type of validity of the measuring instrument was highlighted. Therefore, to ensure face validity of this study, the measuring instruments were examined before distribution to the two experts in marketing and statistics so as to ensure the face validity of the measuring instrument.

In conclusion, the measuring instrument of this study can be considered valid, taking into consideration the various processes to which the measuring instrument has been subjected.

5.5 RELIABILITY OF THE MEASURING INSTRUMENT

Research reliability is the degree to which a research method produces stable and consistent results. A specific measure is considered to be reliable if its application on the same object of measurement for a number of times produces the same results. It is estimated that a Cronbach's alpha value between 0.40 and 0.70 confirms reliability. The higher the value of CR, the more reliable the measuring instrument is.

Table 5.12 depicts the CR estimates for each of the factors.

Table 5.12: CR values for reliability

Factors	CR (Reliability)
TECH	0.727
OV	0.691
BS	0.822
OE	0.715
DOI	0.809
MS	0.625
IB	0.874
CR	0.628

The above result clearly shows that the measuring instrument used for this study was reliable. Most of the variables were above the threshold of between 0.60 and 0.70 as recommended.

Another important analysis carried out to test the reliability of the measuring instrument was the computation of the Cronbach's alpha correlation coefficient. This is the traditional criterion for assessing internal consistency reliability where a high alpha value assumes that the scores of all items with one construct have the same range and meaning.

Table 5.13 depicts the results of the Cronbach's alpha correlation coefficient.

Table 5.13: Cronbach's alpha correlation coefficient for reliability

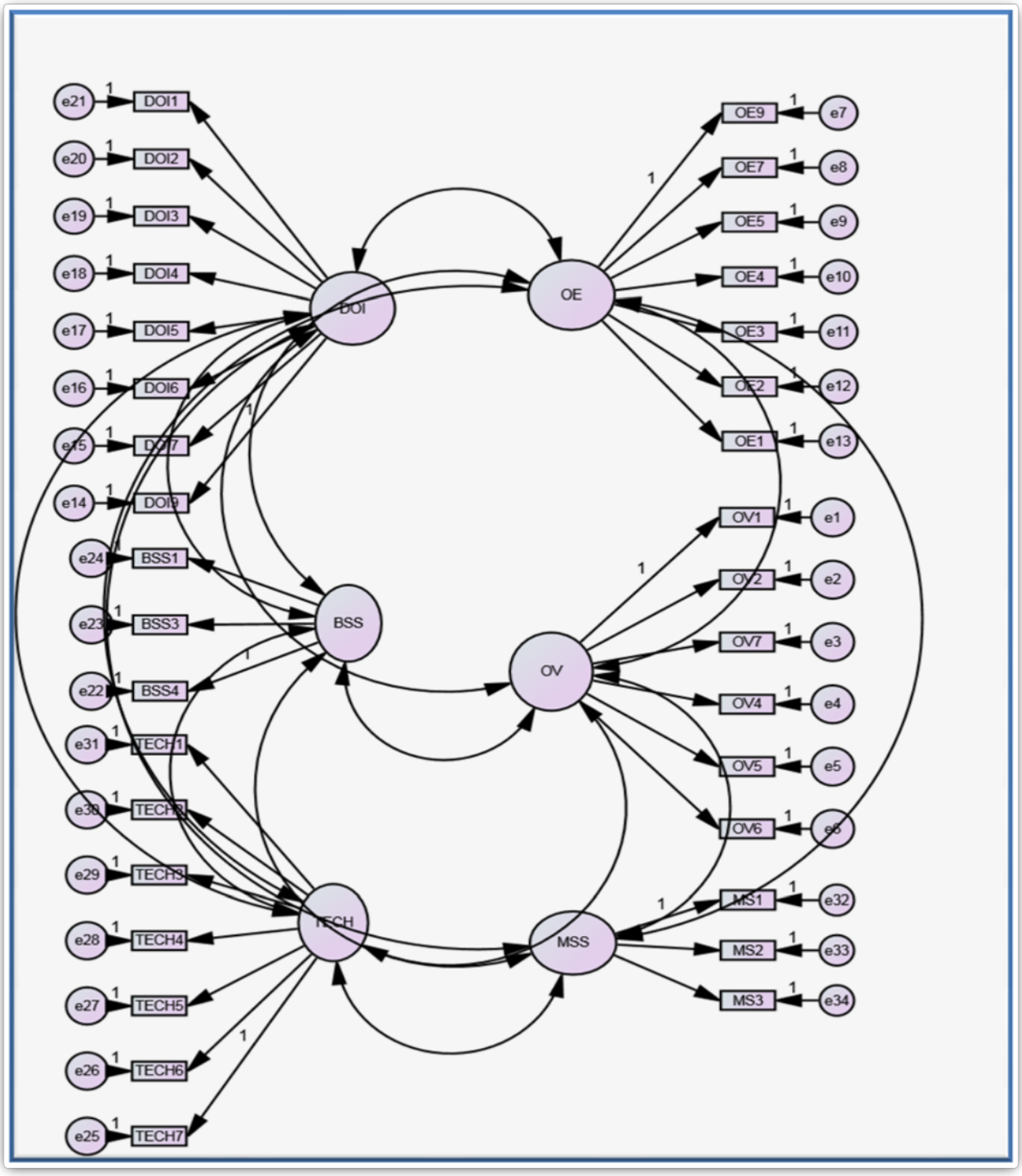
Factors	Cronbach's alpha (reliability)
TECH	0.745
OV	0.741
BS	0.806
OE	0.861
DOI	0.753
MS	0.749
RM	0.868
CR	0.826

If the Cronbach's alpha correlation coefficient is greater than or exceeds 0.70, then it can be confirmed that the measuring instrument for this study is reliable. All the results above demonstrated values greater than the threshold of 0.70 and this confirms the reliability of the measuring instrument for the study.

5.6 SEM

SEM was adopted as the main statistical technique for the data analysis to determine the goodness-of-fit of the hypothesised model. Figure 5.2 below represents this as Model 1 (complete model).

Figure 5.2: Model 1 (complete model)



The indices in Figure 5.2 are used in the SEM process to measure model goodness-of-fit as follows:

- CMIN/DF is the normed chi-square which, in an ideal situation, requires a value of 3 or less as an indication of a high goodness-of-fit.

- TLI denotes the Tucker-Lewis index which should preferably show a value of above 0.9 in order to indicate a very good measure of goodness-of-fit.

- CFI denotes the comparative fit index which in an ideal situation should have a value of above 0.9 to indicate a good degree of goodness-of-fit of the model.

- RMSEA denotes root mean squared error of approximation which should have a required value of less than 0.07 to have a good measure of the model's goodness-of-fit.

- PGFI denotes the parsimony goodness-of-fit index which is used to compare models and the better model will have the highest PGFI.

Model 1 (complete model) used estimated parameters of 125, 60 estimates of variance and 52 point estimates. The SEM results from this model showed a standard scaled chi-square (x^2) measure of 6837.829. The results indicates that the dataset does not fit Model 1 (complete model) and therefore it should be rejected. The CMIN/DF results=3.804 and this is also above the recommended threshold of 3 or less.

Table 5.14: Goodness-of-fit measures for Model 1 (complete model)

Index	Results for Model 1 (complete model)
MSEA	0.053
CFI	0.856
TLI	0.712
PGFI	0.554

Table 5.15 summarises the parameter estimates, standard errors and p-values of Model 1 (complete model).

Table 5.15: Parameter estimates of Model 1 (complete model)

			Estimate	SE.	CR	P value
IB	<---	TECH	0.648	0.289	4.66	0.002
IB	<---	OV	0.581	0.197	4.588	***
IB	<---	BS	0.487	0.16	9.264	***
IB	<---	OE	0.408	0.075	14.76	***
IB	<---	OE	0.397	0.08	4.982	***
IB	<---	DOI	0.796	0.251	3.175	0.001
IB	<---	MS	0.717	0.062	11.601	***
CR	<---	IB	0.780	0.053	10.605	***

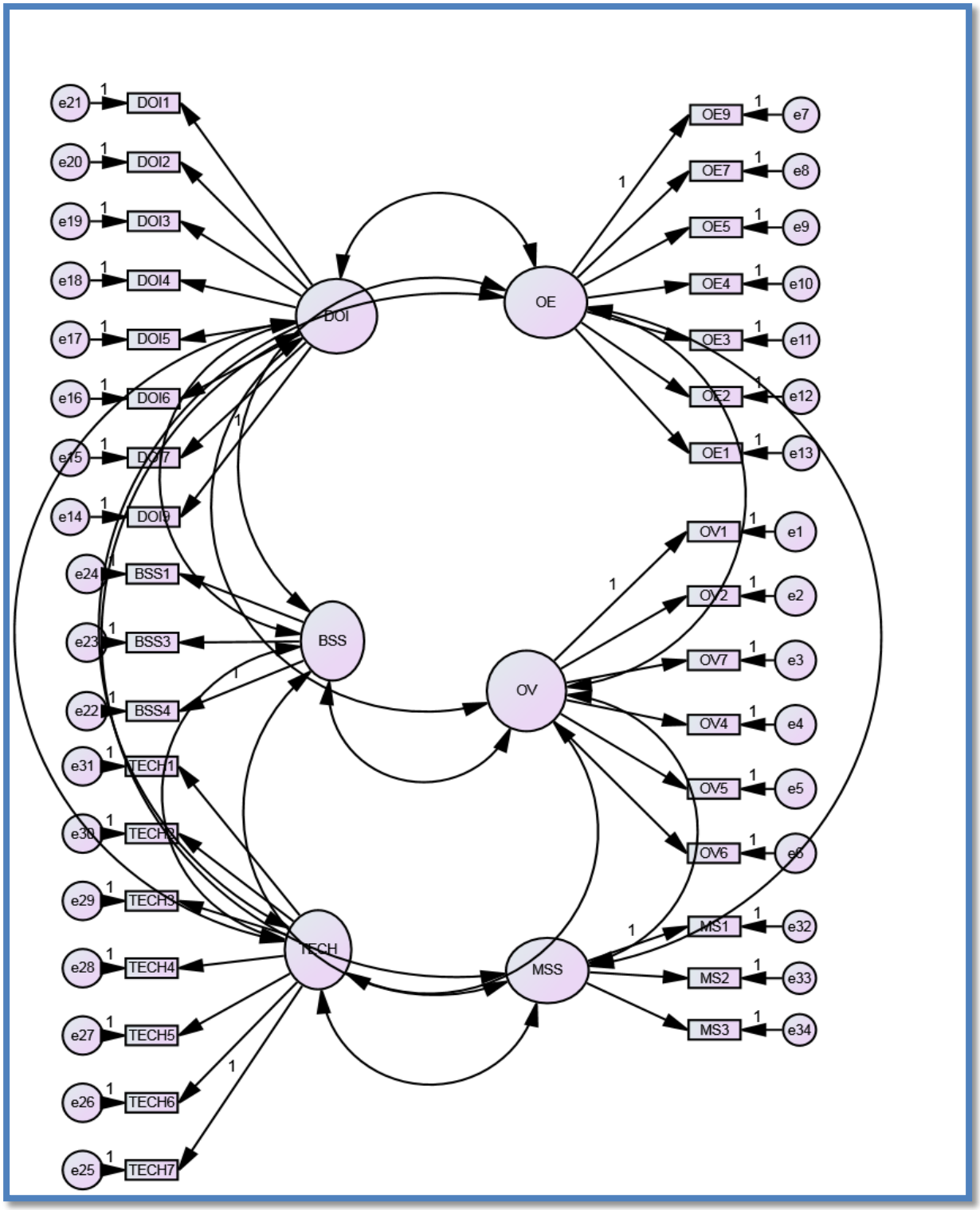
***p-value<0.001

From Tables 5.14 and 5.15 of the model estimates, not all of the factors that were hypothesised to have a relation with the use of Internet banking, were found to be significant. Of the variables, TECH7, OV1, OV3, BS4, OE1, OE6, OE9, DOI8 and MS1 were not having a significant relationship with Internet banking, but the rest of the variables in Model 1 either had a positive or negative significant relationship with Internet banking.

This clearly shows that Model 1 can be improved and possibly the indices might improve in terms of getting closer to the required goodness-of-fit values. Therefore the study tried to improve the fit by defining Model 2 (Adapted model) where variables that are not significant were removed.

Figure 5.3 below represents this model as Model 2 (adapted model).

Figure 5.3: Model 2 (adapted model)



Model 2 (adapted model) estimated 108 parameters, 52 estimates of variance and 52 point estimates. The SEM estimates from this model show a standard scaled chi-square measure of 4951.374. The normed chi-square (x^2/df) for Model 2 (adapted model) is CMIN/DF=3.512. Given that the normed chi-square of Model 2 (adapted model) is still marginally above the recommended value of 3 or less, the model fit could be improved.

Table 5.16: Parameter estimates of Model 2

			ESTIMATE	SE	CR	P value
IB	<---	TECH	0.509	0.25	6.043	0.001
IM	<---	MS	0.503	0.271	5.556	***
IB	<---	DOI	0.466	0.119	12.37	***
IB	<---	OV	0.431	0.098	4.412	***
IB	<---	BS	0.919	0.095	9.644	***
CR	<---	IB	0.889	0.092	13.446	***

***p-value<0.001

Although all variables that were not significant in Model 1 were omitted in Model 2, some variables were still encountered that are not significant in Model 2 and these were TECH6, MS2, DOI1 and OV7. Because of these poor goodness-of-fit indices of Model 2 (adapted model), even though better than Model 1 (complete model), the study proposed a third model from which some variables were omitted that were not significant in Model 2.

Table 5.17 summarises the results of the goodness-of-fit indices for the Model 2 (Adapted Model).

Table 5.17: Goodness-of-fit measures for Model 2 (adapted model)

Index	Results for Model 2 (adapted model)
RMSEA	0.079
CFI	0.894
TLI	0.821
PGFI	0.672

The results above for CMIN/DF, TLI, CFI and PGFI, clearly indicate that Model 2 has relatively better goodness-of-fit indices than Model 1.

In order to get the dataset to fit the model, a cross-correlation was performed between the various factors. The modification index (MI) was set at the conservative limit of 40 and the model re-estimated as Model 3 (proposed model).

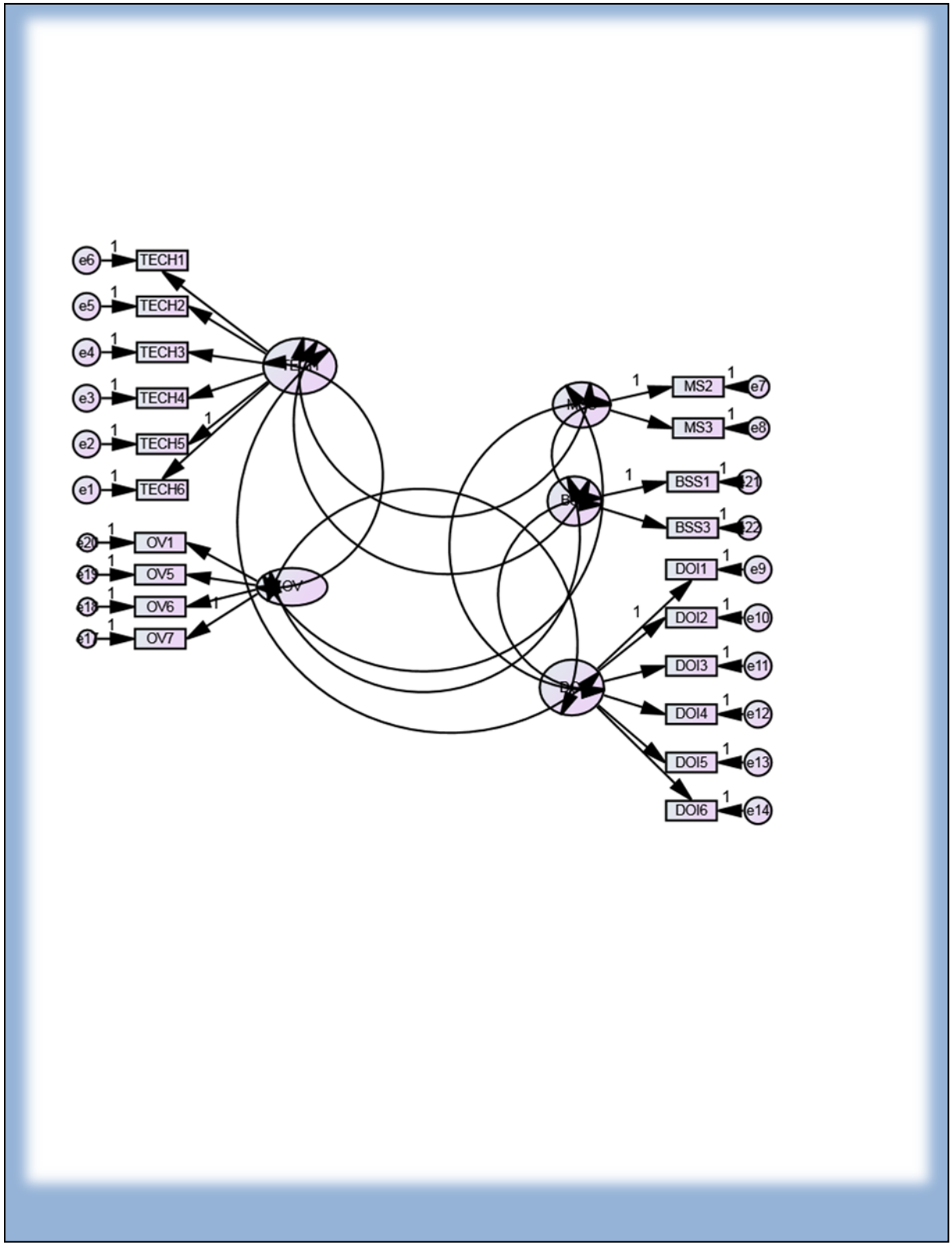
Table 5.18: Cross-correlation and MI results

Interaction	MI	Par change
MS <--->TEC	82.75	0.549
MS <--->DOI	98.434	0.43

MS <---> BS	103.043	0.614
MS <---> OV	65.414	0.156
MS <--- >OE	96.841	0.041
TEC <--->DOI	54.97	0.488
TEC <--->BS	121.04	0.751
TEC <--->OV	95.98	0.247
TEC <--->OE	98.001	0.443
DOI <---> BS	54.864	0.762
DOI <---> OV	74.232	0.169
DOI <--- >OE	86.243	0.135
BS <---> OV	83.764	0.226
BS <--->OE	89.876	0.313
OV<--->OE	128.342	0.497

The MI result for Model 2 (adapted model) indicates that the improvement to the model can be made by including several cross-correlation terms. The justifications for each of these cross-correlations are provided where the nomological validity of the study is discussed. By including these cross-correlation terms, the re-estimated model, namely Model 3 (proposed model), is obtained and presented in Figure 5.4.

Figure 5.4: Model 3 (proposed model)



Here, the insignificant items were removed from the dataset on the basis of not being relevant to literature. For instance, the other services offered by a bank do not necessarily mean that a customer may shift from one bank to another since customers presently deem services in the banks as commodities.

Parameter estimates of 102, 52 point estimates and 42 point estimates were used for Model 3 (proposed model). SEM results from the model show a standard scaled chi-square measure of 4299.477. The normed chi-square (x^2/df) denoted as CMIN/DF=2.897. Based on the recommended threshold of 3 or less for the normed chi-square, it can then be said that the dataset fits the model.

Table 5.19 presents the parameter estimates, standard errors and p-values of Model 3 (proposed model).

Table 5.19: Parameter estimates of Model 3

			Estimate	SE	CR	P value
TECH3	<---	F1	0.509	0.025	5.001	0.01
MS3	<---	MS	0.503	0.0271	5.556	***
DOI3	<---	F2	0.685	0.103	6.646	***
OV1	<---	OV	0.431	0.098	4.412	***
BS3	<---	BS	0.919	0.095	9.644	***
CR	<---	IB	0.609	0.098	9.74	***

***p-value<0.001

Table 5.20 below presents the goodness-of-fit for Model 3 (proposed model).

Table 5.20: Goodness-of-fit measures for Model 3 (proposed model)

Index	Results For Model 3 (proposed model)
RMSEA	0.062
CFI	0.924
TLI	0.884
PGFI	0.728

Table 5.20 shows the goodness-of-fit of the proposed model. The indices here are much better than those of Model 2. For instance, RMSEA indicates a goodness-of-fit of 0.062 which is within the threshold of 0.07. Also, the CFI is well above the recommended threshold of 0.9 and thereby indicating a good fit to the model. TLI of 0.884 fell below the recommended 0.9 but the margin between the expected TLI and the results were very marginal. It can therefore be deemed as a good fit to the model.

From the above, it can be seen that Model 3 (proposed model) is better than Model 2 (adapted model) and Model 1 (complete model). Here, all parameters are important, while the indices have also been improved, coupled with a PGFI of 0.728, representing the highest of the three models.

The SEM analysis shows that the Model 3 (proposed model) is adopted for this study as it has a better fit than the other models. A comparison of the three models is shown in Table 5.21 below.

Table 5.21: Comparison of parameter index

Index	Required value	Model 1 (complete model)	Model 2 (adopted model)	Model 3 (proposed model)
CMin/df	3 or Less	3.8043	3.512	2.897
RMSEA	Less than 0.07	0.053	0.079	0.062
CFI	Above 0.9	0.856	0.894	0.924
TLI	Above 0.9	0.712	0.821	0.884
PGFI	Higher value indicates better fit	0.554	0.672	0.728

Finally, it can be concluded that acceptance of technology, MS, DOA, OV and BS are the significant and important factors that affect banking clients in the usage of Internet banking.

Table 5.22 shows the results of ranking of the independent factors according to their influence on Internet banking adoption.

Table 5.22: Ranking of Internet banking factors

Factor	Estimate	Rank
TECH	0.794	1
OV	0.493	2

OE	0.459	3
MS	0.385	4
DOI	0.236	5
BS	0.131	6

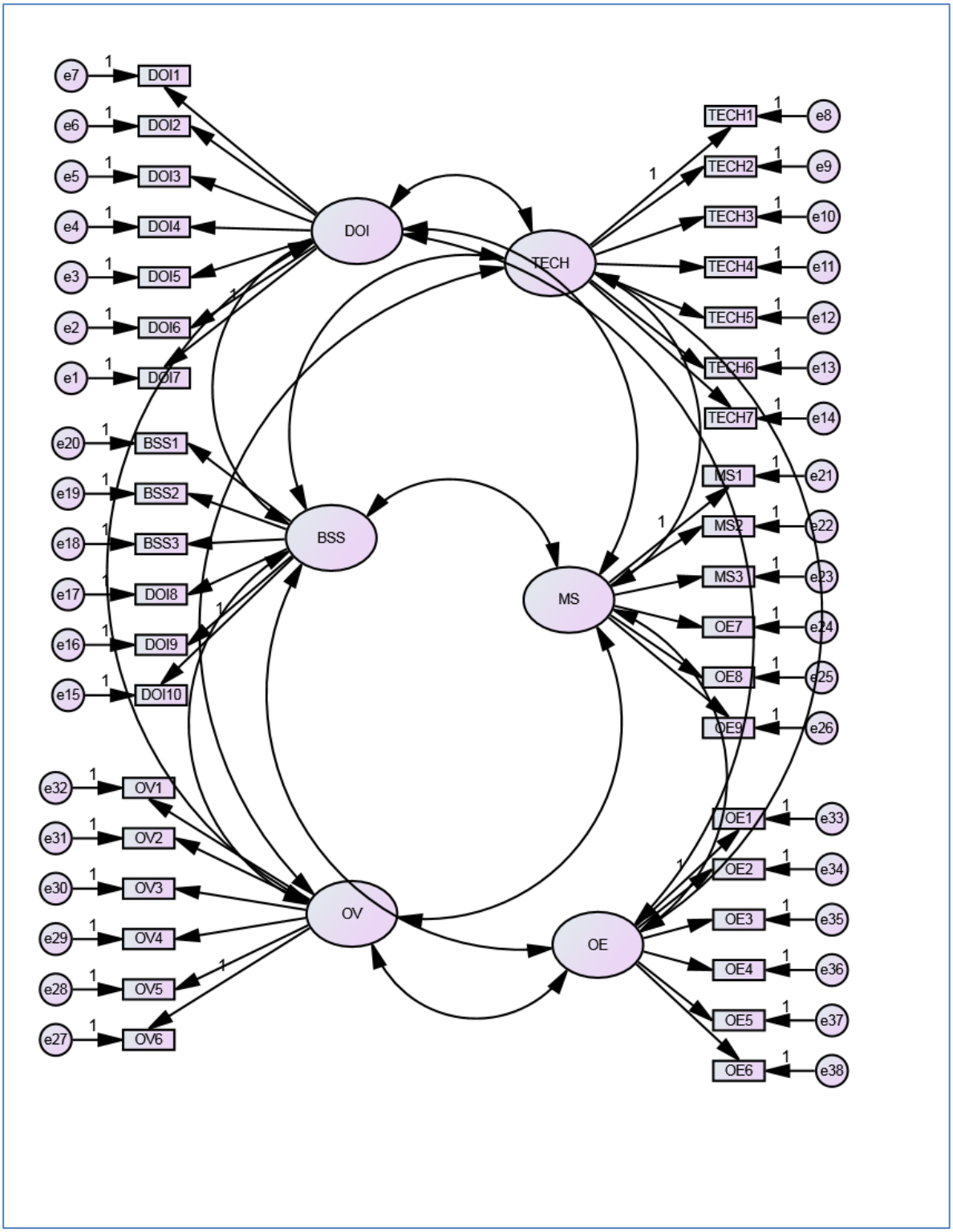
5.6.1 Banking clients versus bank executives

For this study to effectively compare the results of the banking clients with those of the bank executives, it is necessary to present the bank executive results in the same manner as for the banking clients above. Therefore, the following section shows results from the viewpoint of the bank executives.

5.6.2 Empirical result for bank executives conceptual model

For this phase of analysis, the researcher used the dataset of the responses from 100 bank executives. Here, the researcher imposed the same structure or model (Model 3-Proposed model) on the executives' dataset to evaluate whether the data fits the model adequately or not.

Figure 5.5: Model 1 (managers' complete model)



The SEM results from the above model show a standard scaled chi-square measure of 3433.175. The normed chi-square (x^2/df) is CMIN/df=2.938. This is within the threshold of 3 or less and therefore, it can be concluded that the managers' data has a realistic fit with the model.

Table 5.23 presents the parameters, standard errors and p-values of the Model 1 (managers' complete model).

Table 5.23: Model 1 (managers' complete model) and p-values

			Estimate	S.E.	C.R.	P Value
IB	<-->	DOI	0.182	0.036	5.057	0.243
IB	<-->	OE	-0.236	0.045	-5.178	0.323
IB	<-->	OV	0.182	0.041	4.456	***
IB	<-->	MS	0.344	0.061	5.609	0.004*
IB	<-->	BS	0.325	0.044	7.402	0.543
IB	<-->	TECH	0.689	0.065	10.522	0.003*
CR	<-->	IB	-0.315	0.054	-5.867	***

*p-value<0.05, ***p-value<0.001

Table 5.23 shows a relationship between TECH, MS and OV.

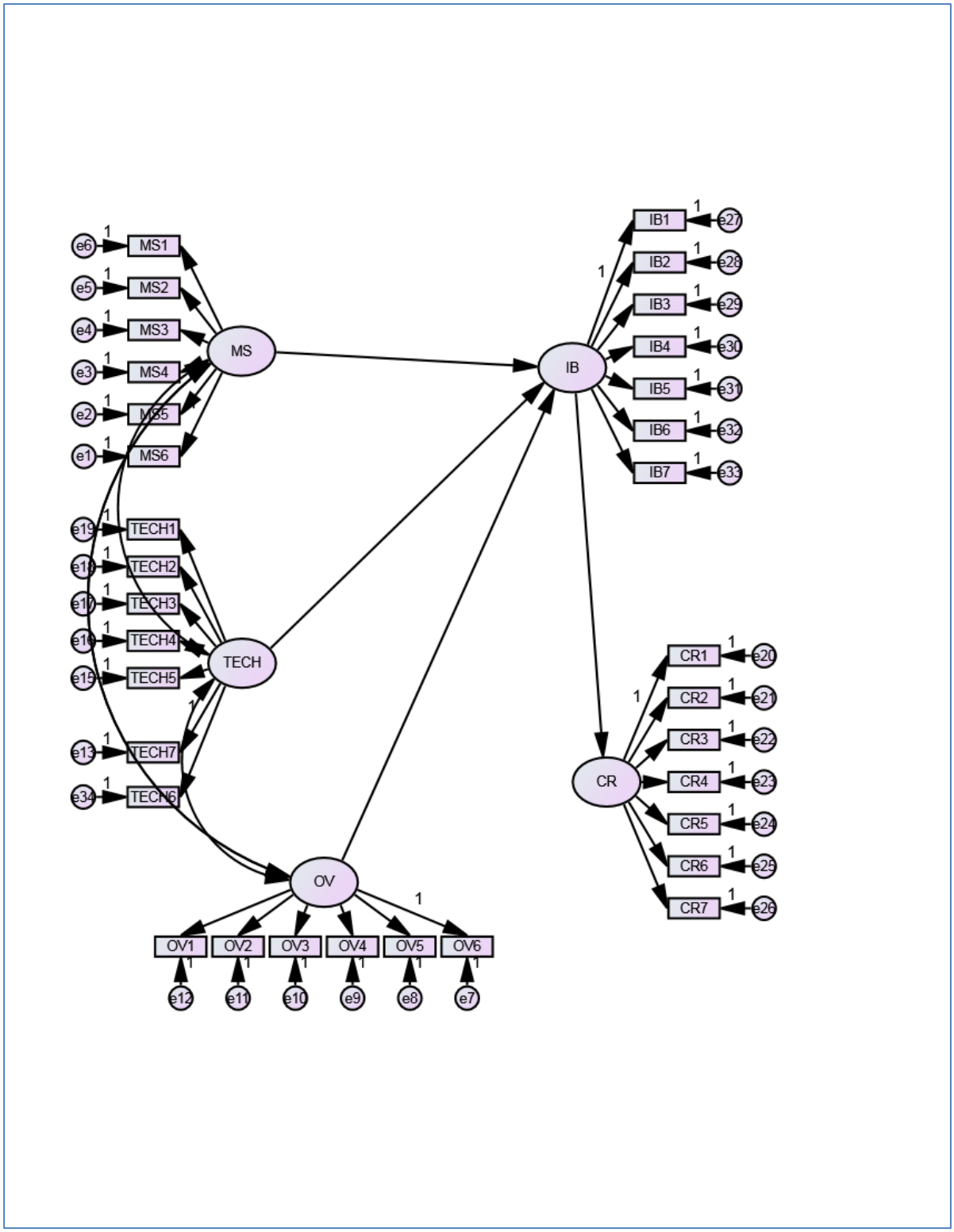
Table 5.24 below depicts the results of the outstanding goodness-of-fit indices for Model 1 (managers' complete model).

Table 5.24: Model 1 (managers' complete model) goodness-of-fit indices

Index	Results For Model 1 (managers' complete model)
RMSEA	0.053
CFI	0.519
TLI	0.469
PGFI	0.471

The results of the SEM table (managers' model 1) above indicate a poor goodness-of-fit. Therefore some variables were removed thereby generating a second model (adapted model) which is presented in Figure 5.6.

Figure 5.6: Model 2 (managers' adapted model)



From the SEM analysis, the scaled chi-square computed for this model was 1025.768 while that of the normed chi-square (x^2/df) is CMIN/df =2.093. This result is within the recommended threshold of 3 and it can be said that the managers' dataset reasonably fits the model. The below shows the parameter estimates, standard errors and p-values of Model 2 (managers' adapted model).

Table 5.25: Model 2 (managers' adapted model), parameter estimates and p-values

			Estimate	S.E.	C.R.	P Value
IB	<-->	OV	0.541	0.009	3.478	0.004*
IB	<-->	MS	0.645	0.021	4.024	0.005*
IB	<-->	TECH	0.791	0.024	4.187	***
CR	<-->	IB	0.951	0.302	4.687	***

*p-value<0.01, ***p-value<0.001

Model 2 (managers' adapted model) above shows important relationships between the factors.

Table 5.26 presents the results of the goodness-of-fit to Model 2 (managers' adapted model).

TABLE 5.26: MODEL 2 (MANAGERS' ADAPTED MODEL) GOODNESS-OF-FIT INDICES

Index	Results For Model 2 (managers' complete model)
RMSEA	0.168
CFI	0.640
TLI	0.693
PGFI	0.574

Table 5.26 shows that Model 2 (managers' adapted model) is an improvement on Model 1 (managers' complete model). Here, all the parameters are important to the study; the indices are better than the previous ones, coupled with a good PGFI for Model 2 (managers' adapted model). It is important to note that despite the improvement in Model 2 (adapted model) from Model 1 (complete model), the SEM indices are below the minimum threshold criteria. Therefore, even though Model 2 (adapted model) shows important relationships between the factors, the goodness-of-fit indices are not satisfactory.

The results from the managers show a bias towards their own banks where they tend to give a very good response to the questionnaire. This bias has seen them projecting a positive view of the bank even if they do not agree with what is actually

happening in their banks. These positive responses have potentially skewed the results towards strongly agree.

This skewedness towards strongly agreeing by the managers is confirmed by the mean scores and standard deviation from the responses as shown in Table 5.27 below.

Table 5.27: Managers' mean score and standard deviation

Factor	Mean	Standard deviation
BS	6.09	0.753
DOI	5.14	0.711
MS	5.86	0.829
OE	6.48	0.87
OV	5.42	0.365
TECH	4.28	0.544
IB	5.13	1.004
CR	5.98	1.001

The average mean score is above the threshold of 5, indicating that the managers tilt towards strongly agreeing that their bank takes into consideration MS, BS, its OV, its OE, the process they adopt for DOI as well as variables in the TAM procedure.

By comparing the bank executives' and customers' viewpoints, the following assertions can be deduced:

- The banking clients and bank executives agree that the Internet banking is a new and important medium for conducting banking transactions in this technological age in Ghana, especially with a growing middle class.

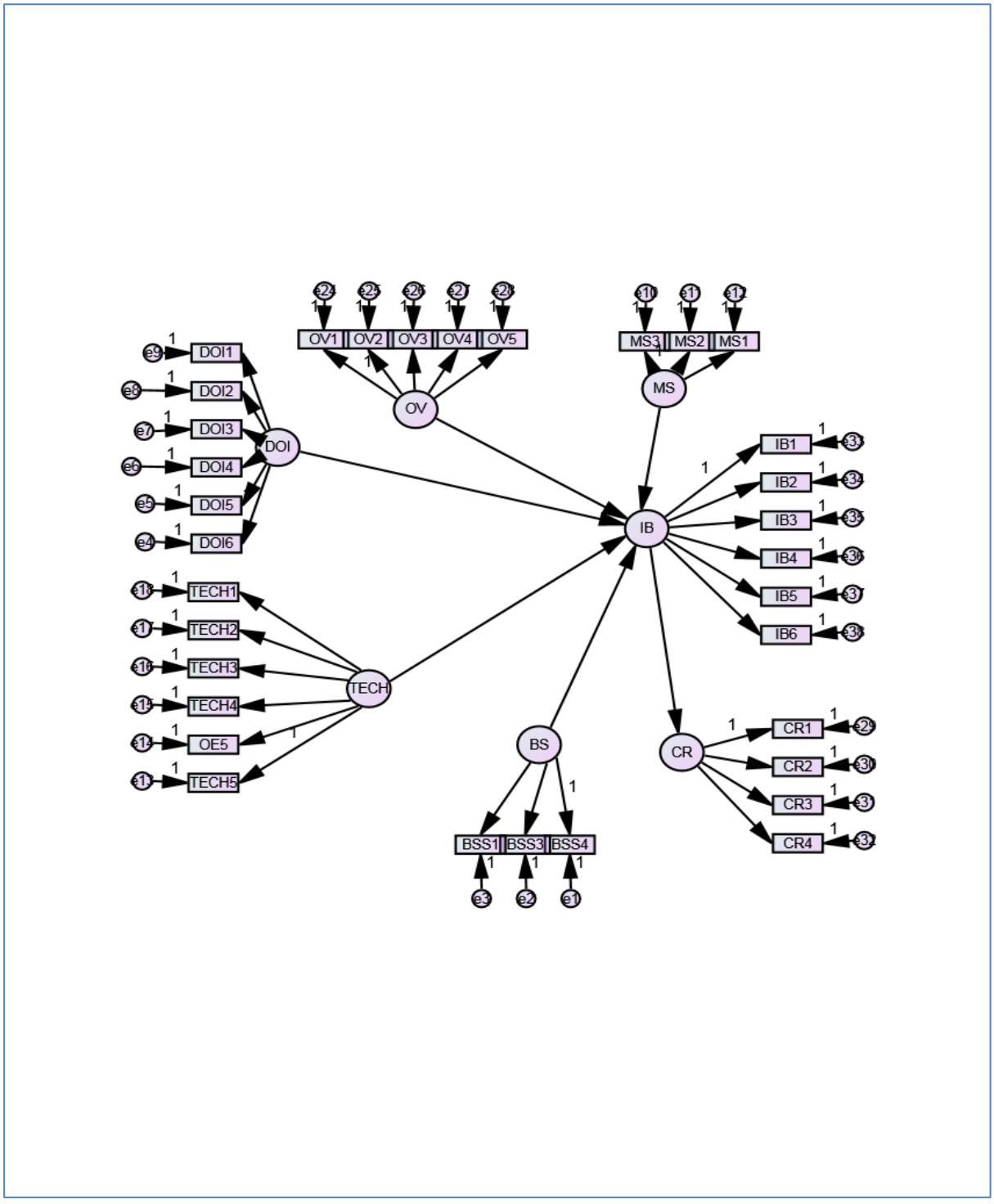
- The bank managers deem all the independent variables to be more important than do the banking customers. This is evidenced by the high mean score of the banking executives – far higher than the mean score of the banking clients who ranked DOI and TECH higher than all other variables considered.

These results were anticipated from the study since banks tend to consider these factors before implementing the Internet banking technology, in order to reduce their branch expansion costs and other overhead costs, coupled with being in a competitive position with other banks, especially those which are foreign-dominated.

5.7: PROPOSED MODEL WITH EMPIRICAL RESULTS

From the results of the empirical study presented in section 5.3, the final banking clients model for this study is presented in Figure 5.7.

Figure 5.7: Final banking clients model with estimated parameters showing factor relationships



From Figure 5.6 above, it can be concluded that banking clients agree that there are positive relationships between the independent variables and the dependent variable; therefore the entire set of hypotheses are accepted even though the mean score of the banking executives is far higher than that of the banking clients. However, they regarded diffusion and TECH far higher than the rest of the variables as shown above.

5.8 HYPOTHESISED RELATIONSHIPS

Model 3 (proposed model) of the study showed that all the hypothesised relationships are statistically significant at the 0.01 level of significance. This presupposes that the estimated parameters used in the SEM fit model are important to the adoption of Internet banking in Ghana. Therefore, the researcher needs to accept the result of the study, thereby indicating that the variables tested are the determinants of Internet banking adoption.

From the table below, it is evidenced that all the estimated parameters are positive which shows that there exists a positive relationship between the independent variables, namely MS, TAM, BS, DOI, OE and OV have a direct influence on customers adopting Internet banking. Therefore, when these factors are taken into consideration seriously by these banks, adoption of Internet banking by their customers may be easier than anticipated.

Table 5.28 shows the result of the parameter estimates and the p-values to evaluate hypothesised determinants.

Table 5.28: Parameter estimates and the p-values to evaluate hypothesised determinants

			Estimate	P values
IB	<---	TECH	0.630	***
IB	<---	OV	0.532	***
IB	<---	BS	0.306	***
IB	<---	OE	0.186	***
IB	<---	DOI	0.879	***
IB	<---	MS	0.202	0.004

***p-value<0.001

The study's hypothesis results are summarised below:

H_0^1: *A bank with a larger market share has an influence on the adoption of Internet banking.*

A statistically significant positive relationship between MS and Internet banking adoption ($p<0.1$) is reported. H_0^1 is therefore accepted. The null hypothesis is rejected. Thus there is sufficient evidence at a 99 per cent level of significance to support the alternative hypothesis.

H_0^2: *A bank's perceived way of accepting technology has an influence on the adoption of Internet banking.*

A statistically significant positive relationship between TECH and Internet banking adoption ($p<0.001$) is reported. H_0^2 is therefore accepted. The null hypothesis is rejected. Thus there is sufficient evidence at a 99 per cent level of significance to support the alternative hypothesis.

H_0^3: *A bank's diffusion of innovation has an influence on the adoption of Internet banking.*

A statistically significant positive relationship between DOI and Internet banking adoption ($p<0.001$) was found. H_0^3 is therefore accepted. The null hypothesis is rejected. Thus there is sufficient evidence at a 99 per cent level of significance to support the alternative hypothesis.

H_0^4: *A bank's business strategy has an influence on the adoption of Internet banking.*

A statistically significant positive relationship between BS and Internet banking adoption ($p<0.1$) was found. H_0^4 is therefore accepted. The null hypothesis is rejected. Thus there is sufficient evidence at a 90 per cent level of significance to support the alternative hypothesis.

H_0^5: *A bank's organisational variables have an influence on the intention to adopt Internet banking.*

A statistically significant positive relationship between OV and Internet banking adoption ($p<0.001$) was found. H_0^5 is therefore accepted. The null hypothesis is rejected. Thus there is sufficient evidence at a 99 per cent level of significance to support the alternative hypothesis.

H_0^6: *A bank's operational efficiency has an influence on the adoption of Internet banking.*

A statistically significant positive relationship between OE and Internet banking adoption ($p<0.1$) was found. H_0^6 is therefore accepted. The null hypothesis is rejected. Thus there is sufficient evidence at a 90 per cent level of significance to support the alternative hypothesis.

The study also revealed that among the variables considered to influence the adoption of Internet banking by customers of various banks in Ghana, the variables under TAM ranked the highest with an estimate of 0.794<0.001. The questionnaire sought the views that a potential user's overall attitude using a given system is a major determinant of whether or not the user actually uses it. In addition, attitude towards using the technology or innovation, in turn, is a function of two major beliefs, namely PU and PEOU. It was realised that consumers will patronise a new technology when it is relatively better than previous ones and simpler to use. It is therefore imperative that banks highlight the benefits of the Internet banking as a medium of conducting one's transactions as well as designing the website for it to be user-friendly.

OV were the second-highest influence of the determinants of Internet banking with an estimate of 0.493<0.0001. A bank's association with a bank-holding company emerged as an important determinant in the adoption decision of customers, imitation of early adopters, market characteristics which represent consumer demand for Internet banking due mainly to the middle class of the banking population, banks' location in urban areas, in markets with younger and better-educated populations and in regions with higher per capita income and economic conditions in the country.

Banks with good OE were the third-ranked variable with an estimate of 0.459<0.0001. This is in terms of the various security systems put in place, profitability, return on assets and return on equity of the banks surveyed.

The next section presents a summary of the empirical data and analysis.

5.9 SUMMARY

This chapter surveyed the results and discussions of the secondary research objectives of the study. The chapter commenced with a brief summary of the

objectives of the empirical investigations, and the conceptual model to be tested as stated in Chapter One was reproduced. The empirical findings coupled with detailed discussions explaining the results of the study were also presented in this chapter.

The relationship between the demographic characteristics of the two sampling units and the independent and dependent variables were tested with the sole rationale to evaluate whether the proposed model is generic across different demographic groupings. Results concerning the descriptive statistics, validity, reliability of the measuring instruments, testing of hypotheses, MANOVA to determine the various comparisons, and comparison between the banking clients and banking executives were also evaluated. The SEM goodness-of-fit results to depict the fits of the data to the conceptual model were presented from both the customers' and banking executive's perspectives. Various models were generated with Model 3 (proposed model) of the clients' perspectives which highlighted the influence of the independent variables on the dependent variable.

In the final chapter, the conclusion and recommendations of this research study will be made.

CHAPTER SIX
SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter includes a discourse on the conclusions, limitations and implications of this study. The impact of the findings on the conceptual model developed in Chapter One is assessed, together with the various research objectives. The chapter will conclude by proposing possible research areas for future studies.

6.2 SUMMARY OF THE STUDY

This study was set out with the main objective of determining the factors (determinants) that bank executives and banking customers in Ghana takes into consideration before adopting the Internet banking as a new medium of conducting banking transactions. Thus, the perceptions of both banking clients and bank executives regarding Internet banking adoption were evaluated.

The independent variables in the conceptual model included MS, TAM, OV, OE, DOA, and BS, and the dependant variable was Internet banking. From the SEM results in Chapter Five, it was realised as suggested in the literature review of Chapters Two and Three, that the independent variables has a direct relationship on the dependent variable as depicted in the conceptual model. The various research objectives as indicated in Chapter One were obtained. Table 6.1 shows the various sections of the objectives attained and their corresponding chapters and annexures.

Table 6.1: Study objectives covered

Objective	Chapter and annexure
Primary objective: Develop a firm-level framework to investigate the determinants of Internet banking adoption by banks in Ghana	Chapter Four Chapter Five
To execute thoroughly secondary study relating to the Internet banking	Chapter One Chapter Two Chapter Three
To identify and implement the most appropriate research methodology to address the research problem statement and research objectives	Chapter One Chapter Four
To identify appropriate research instruments for the primary data sourcing from banking clients and bank executives	Chapter Four Annexure A Annexure B
To conduct an empirical investigation to identify the influence of selected variables on Internet banking adoption in Ghana from the customer perspective	Chapter Four Chapter Five Annexure A
To conduct an empirical investigation to identify the influence of selected variables on Internet banking adoption in Ghana from the bank executives	Chapter Four Chapter Five

perspective	Annexure B
To source for primary data from banking clients and bank executives	Chapter Four Annexure A Annexure B
To statistically analyse the primary data and test the hypothesis	Chapter Five
To present research findings to address potential determinants of Internet banking adoption factors	Chapter Five Chapter Six
To make recommendations on methods and strategies through which banks can adopt to propagate the rate at which clients adopt and use the Internet banking medium to conduct their transactions	Chapter Six

From the study, the banking executives' responses were found to be more favourable than those of banking clients even though they shared the perception that the independent variables have a relationship with the dependent variable.

In comparing the banking clients' responses to those of the bank managers, the results of this study indicate that DOI attained the highest mean score followed by TECH and OV. Thus the banking clients' respondents were of the view that the processes of DOI by their banks are of paramount importance to them followed by TECH. However, BS attained the highest standard deviation scores while DOI obtained the lowest score in the responses by the banking managers. This means

that respondents share similar views with regard to BS but differ on the degree of impact of DOI on Internet banking adoption, even though they both recognise its importance.

The population group also indicated that the male respondents are the dominant Internet banking users, while those aged between 20 and 50 dominated the users' age category. It is also important to note that respondents in these categories are educated and therefore understand the importance and usage of technology such as the Internet banking medium.

Results of the study showed that banking clients and bank executives agree that the Internet banking is a new and important medium for conducting banking transactions in this technological age in Ghana especially with a growing middle class. The bank managers deemed all the independent variables as more important than did the banking customers. This is evidenced by the high mean score of the banking executives which was far higher than the mean score of the bank clients.

It is suggested that in order to bridge the perceptions shared by the two groups of respondents, regular customer surveys should be conducted to remain aware of clients' perceptions regarding factors they will consider before adopting Internet banking.

6.3 RECOMMENDATIONS ON INTERNET BANKING ADOPTION FACTORS

The study has revealed important and numerous high business echelon strategies that can be pursued by banks in Ghana to aid their customers to adopt this medium for transacting banking business. These strategies are detailed below.

- Given the growing middle class of banking customers who are fascinated by the Internet, banks should highlight the benefits of the use of Internet banking

as a medium for conducting banking transactions during their promotional activities. The ease of use, elimination of long queues in the banking halls, 24-hour service channel, conducting banking transactions from the comfort of the home or office, speed of banking, cost effectiveness, time value for money, as well as transfer of funds between accounts and effective ways to effect bill payments, should all be emphasised.

- In the quest to move the majority of their customers to the online banking environment while maintaining expensive branch networks, banks should make Internet banking website design, processes and programmes user-friendly and easier to understand. Website designers should pay attention to colour, font sizes, font types, and advertise speed of page downloads, Internet banking devices, authentication of transactions coupled with trust and security of the website.

- With each passing day, technologies across the world are being simplified for easy introduction into the business market to meet customer demand for less complex technologies. Therefore, the manner in which banks introduce innovation or new technology to clients should be clear and simple to understand. Technical language should be avoided while thorough explanations and process flow mapping should be provided for the understanding of the customers. Banks should avoid introducing complex technology into the Ghanaian banking environment otherwise, only customers with some technological background would then understand its use and benefits thereby depriving the average customer with low or non technological background access to such products.

- With growing competition in the financial services industry, especially between banks, those banks with a large MS and extensive branch networking, an already huge investment in technologies, and a strong balance sheet, should

use the Internet banking platform to cross-sell other products including e-banking products to their customers.

6.4 CONTRIBUTIONS OF THE STUDY

The study has added to the body of knowledge in technology adoption, and diffusion specifically Internet banking.

Firstly, due to the diverse social-cultural background of respondents of the study, methodological triangulation was adopted for collecting data to enhance the validity of the study.

Secondly, the measuring instruments used for this study can be replicated in other areas of study as well as in different geographical locations with similar characteristics to the respondents in Ghana to ascertain if there exist similarities to the results of this study.

The use of SEM for the data analysis through SPSS AMOS 22 is very significant in the geographical area of this study. This is to determine the fit or otherwise of the hypothetical model introduced in Chapter One.

6.5 AREAS FOR FUTURE RESEARCH

Internet banking is gradually gaining momentum in developing countries such as Ghana. In order to fully understand the Internet banking dynamics, the extent to which banking clients and bank managers are influenced by website design and content might be another research area to undertake.

Trust and security of the Internet banking environment is another important research area that can be the studied. This stems from the fact that there is considerable apprehension in customers about adopting this medium as a result of their cultural

backgrounds where most transactions are conducted by the physical exchange of money.

Future studies could be extended to various geographical locations in Ghana by taking into consideration all the ten (10) regions. The geographical locations could also be extended by comparing two or three different countries in Africa and Europe.

Research in the area of Internet banking taking into consideration cultural issues is another interesting area for future research.

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ANNEXURE A

ANNEXURE B

BANKING CLIENTS' QUESTIONNAIRE

Banking clients' questionnaire on the factors that affect the adoption of Internet banking in Ghana

Dear Sir/Madam. The Department of Marketing Management at the Nelson Mandela Metropolitan University (NMMU) is conducting research to determine the factors that affect the adoption of Internet banking in Ghana. In an attempt to conduct the research, we kindly request you, as a banking client, to complete the following questionnaire in an honest manner. All responses will be treated as confidential and the results of the survey will be available on request. Please note that there are no right or wrong answers. Therefore, answer the questions by indicating your perceptions of your MAIN (primary) bank (the bank where you have most of your accounts or your main account). Thank you in anticipation.

1. Please indicate your experience and skill in using the Internet.

	Strongly Disagree						**Strongly Agree**
I am very skilled in using the Internet	1	2	3	4	5	6	7
I consider myself knowledgeable about good search techniques on the Internet	1	2	3	4	5	6	7
I know less about using the Internet than most users	1	2	3	4	5	6	7
I know how to find what I want on the Internet using a search engine	1	2	3	4	5	6	7

I have been using the Internet for more than 12 months	1	2	3	4	5	6	7
I use the Internet frequently – more than 12 times in a month	1	2	3	4	5	6	7
I have been using the Internet for at least 20 hrs per week.	1	2	3	4	5	6	7
I use the Internet for no more than checking emails.	1	2	3	4	5	6	7

2. Please indicate the banking products and services you are currently using. (Please check all that apply)

- ☐ Account information and balance enquiry
- ☐ Current accounts
- ☐ Check cancellation
- ☐ Loan application
- ☐ Information on bank and currency rates
- ☐ Cash deposits
- ☐ Wire transfers
- ☐ Bank drafts
- ☐ Saving accounts
- ☐ Investment accounts
- ☐ Purchasing of foreign currency
- ☐ Other …….....

3. Please indicate the extent to which you considered or will consider the following criteria in choosing your Internet bank.

	Not at all Important						**Very Important**
Familiarity with the bank	1	2	3	4	5	6	7
Size of the bank	1	2	3	4	5	6	7
Reputation of the bank	1	2	3	4	5	6	7
Variety of services offered by the bank	1	2	3	4	5	6	7
Ownership of the bank - Local	1	2	3	4	5	6	7
Ownership of the bank - Foreign	1	2	3	4	5	6	7

4. I am confident of using Internet banking

	Not at all confident						**Very Confident**
If I have only the online instructions for reference.	1	2	3	4	5	6	7
Even if there is no one around to show me how to do it.	1	2	3	4	5	6	7
Even if I have never used such a system before.	1	2	3	4	5	6	7

If I have just seen someone using it before trying it myself.	1	2	3	4	5	6	7
If I have just the online “help” function for assistance.	1	2	3	4	5	6	7

5. Please indicate your opinion that best describe how you perceive the following Internet banking activities;

	Strongly Disagree						**Strongly Agree**
Internet banking makes it easier for me to conduct my banking transactions.	1	2	3	4	5	6	7
Internet banking gives me greater control over my finances.	1	2	3	4	5	6	7
Internet banking allows me to manage my finances more efficiently.	1	2	3	4	5	6	7
Internet banking is a convenient way to manage my finances.	1	2	3	4	5	6	7
Internet banking allows me to manage my more effectively.	1	2	3	4	5	6	7
I find Internet banking useful for managing my financial resources.	1	2	3	4	5	6	7

6. Please indicate your opinion on how Internet banking is compatible with your values.

	Strongly Disagree						**Strongly Agree**
Internet banking is compatible with my lifestyle.	1	2	3	4	5	6	7
Using Internet banking fits well with the way I like to manage my finances.	1	2	3	4	5	6	7
Using the Internet to conduct banking transactions fits into my working style.	1	2	3	4	5	6	7

7. Please select the appropriate responses that best describe your perceptions of Internet banking.

	Strongly Disagree						**Strongly Agree**
Using Internet banking requires a lot of mental effort.	1	2	3	4	5	6	7
Using Internet banking can be frustrating	1	2	3	4	5	6	7
Internet banking is an easy way to conduct banking transactions.	1	2	3	4	5	6	7

I want to be able to try Internet banking for at least one month.	1	2	3	4	5	6	7
I want to be able to use Internet banking on a trial basis to see what it can do.	1	2	3	4	5	6	7
I am confident over the security aspects of Internet banking in Ghana.	1	2	3	4	5	6	7
Information concerning my Internet banking transactions can be tampered with by others.	1	2	3	4	5	6	7
Information concerning my Internet banking transactions will be known to others.	1	2	3	4	5	6	7

8. Please indicate your agreement or disagreement with the extent to which you believe your decision to adopt Internet banking would be influenced by.

	Strongly Disagree						**Strongly Agree**
Friends	1	2	3	4	5	6	7
Family	1	2	3	4	5	6	7
Colleagues/peers	1	2	3	4	5	6	7

Media	1	2	3	4	5	6	7

9. How likely would you use Internet banking if the bank charges

	Very Unlikely						**Very Likely**
A flat fee per month for using Internet banking.	1	2	3	4	5	6	7
A flat fee per month plus a fee per transaction for using Internet banking.	1	2	3	4	5	6	7
No fee for using Internet banking	1	2	3	4	5	6	7

10. Do you currently have an Internet banking account with any bank?

☐ **Yes**

☐ **No**

If you answered “No” to having an Internet bank account, please continue; otherwise go to Section 3.

11. What are the main reasons that you have not opened an Internet bank account yet? (Please check all that apply)

☐ Never heard of Internet banking

☐ Concerned about security

☐ Haven’t taken time to open an account

☐ Don’t see any real value in having this type of account

☐ It's still too early. Would like to see how it works, then I may open an account

☐ Other……

12. I will be interested in using Internet banking if it is available to me. (Please indicate your response)

Very Unlikely						**Very Likely**
1	2	3	4	5	6	7

13. How likely is it that you will open Internet bank account within the

	Very Unlikely						**Very Likely**
Next 6 Months	1	2	3	4	5	6	7
Next 12 Months	1	2	3	4	5	6	7
Next 18 months	1	2	3	4	5	6	7

14 General and biographical information. Please respond to the following

Gender ☐ Male ☐ Female

Age

☐ 20-29

☐ 30-39

☐ 40-49

☐ 50-59

Highest Education Level

☐ Primary School

☐ Junior High School

☐ Senior High School

☐ Polytechnic

☐ Bachelor’s Degree

☐ Master’s Degree

☐ Doctorate Degree

☐ Others

Current Profession

☐ Student

☐ Professional

☐ Academic

☐ Self-Employed

☐ Manager

☐ Executive

- ☐ Technician
- ☐ Retiree/Housewife
- ☐ Other

Average Monthly Income

- ☐ Less than GHS 1,000
- ☐ GHS 1,000 – GHS 1,999
- ☐ GHS 2,000 – GHS 2,999
- ☐ GHS 3,000 – GHS 3,999
- ☐ GHS 4,000 – GHS 4,999
- ☐ GHS 5,000 – GHS 5,999
- ☐ GHS 6,000 – GHS 6,999
- ☐ Not Applicable (Student)

Thank you very much for your participation.

Kind regards

Edem Bart Williams (Researcher) and Prof M. Tait (Promoter)

ANNEXURE C

BANK MANAGERS' QUESTIONNAIRE

Bank managers' questionnaire on factors that determine Internet banking adoption in Ghana

Dear Sir/Madam. The Department of Marketing Management at the Nelson Mandela Metropolitan University (NMMU) is conducting research to determine the factors that affect the adoption of Internet banking in Ghana. In an attempt to conduct the research, we kindly request you, as a banking client, to complete the following questionnaires in an honest manner. All responses will be treated as confidential and the results of the survey will be available on request. Please note that there is no right or wrong answers. Therefore, answer the questions by indicating your perceptions of your MAIN (primary) bank (the bank where you have most of your accounts or your main account). Thank you in anticipation.

1. Please indicate your experience and skill in using the Internet.

	Strongly Disagree						**Strongly Agree**
In my opinion the clients of my employer bank are very skilled at using the Internet	1	2	3	4	5	6	7
I consider the clients of my employer bank knowledgeable about good search techniques on the Internet	1	2	3	4	5	6	7
The clients of my bank know less about using the Internet than most	1	2	3	4	5	6	7

users							
My bank's clients know how to find what I want on the Internet using a search engine	1	2	3	4	5	6	7
In my estimation my bank's clients have been using the Internet for more than 12 months	1	2	3	4	5	6	7
In my view my bank's clients use the Internet frequently – more than 12 times in a month	1	2	3	4	5	6	7
The clients of my bank have been using the Internet for at least 20 hrs per week.	1	2	3	4	5	6	7
My employer bank's clients use the Internet for no more than checking emails.	1	2	3	4	5	6	7

2. Please indicate the banking products and services that your employer bank is currently using; (Please check all that apply)

- ☐ Account information and balance enquiry
- ☐ Current accounts
- ☐ Check cancellation
- ☐ Loan application
- ☐ Information on bank and currency rates
- ☐ Cash deposits
- ☐ Wire transfers
- ☐ bank Drafts
- ☐ Saving accounts
- ☐ Investment accounts
- ☐ Purchasing of foreign currency
- ☐ Other …….....

3. Please indicate the extent to which the following criteria influence your employer bank's clients to consider in choosing your Internet bank.

	Not at all Important						**Very Important**
Familiarity with my bank	1	2	3	4	5	6	7
Size of my bank	1	2	3	4	5	6	7
Reputation of my bank	1	2	3	4	5	6	7
Variety of services offered by my bank	1	2	3	4	5	6	7
Ownership of my bank - Local	1	2	3	4	5	6	7
Ownership of my bank - Foreign	1	2	3	4	5	6	7

4. The clients of my bank are confident of using Internet banking

	Not at all confident						**Very Confident**
If only my bank's clients have the online instructions for reference.	1	2	3	4	5	6	7
Even if there is no one around to show my bank's client how to do it.	1	2	3	4	5	6	7
Even if my bank's client have never used such a system before.	1	2	3	4	5	6	7

If my bank's client have just seen someone using it before trying it myself.	1	2	3	4	5	6	7
If my bank's client have just the online "help" function for assistance.	1	2	3	4	5	6	7

5. In your opinion please indicate what best describes how the clients of your employer's bank perceive the following Internet banking activities;

	Strongly Disagree						**Strongly Agree**
Internet banking makes it easier for my bank's client to conduct my banking transactions.	1	2	3	4	5	6	7
Internet banking gives my bank's clients greater control over my finances.	1	2	3	4	5	6	7
Internet banking allows my bank's client to manage my finances more efficiently.	1	2	3	4	5	6	7
Internet banking is a convenient way to manage the finances of my bank's clients.	1	2	3	4	5	6	7
Internet banking allows my bank's	1	2	3	4	5	6	7

clients to manage my more effectively.							
I find Internet banking useful for managing the financial resources of my bank's clients.	1	2	3	4	5	6	7

6. In your opinion please indicate how Internet banking is compatible with the values of your employer's bank

	Strongly Disagree						**Strongly Agree**
Internet banking is compatible with the Lifestyle of my bank's client.	1	2	3	4	5	6	7
Using Internet banking fits well with the way my bank's client like to manage their finances.	1	2	3	4	5	6	7
Using the Internet to conduct banking transactions fits into the working style of my bank's clients.	1	2	3	4	5	6	7

7. In your opinion please select the appropriate responses that best describe the perceptions of your employer bank's client regarding Internet banking.

	Strongly Disagree						**Strongly Agree**
My bank's clients require a lot of mental effort to use Internet banking.	1	2	3	4	5	6	7
Using Internet banking can be frustrating for my bank's clients.	1	2	3	4	5	6	7
Internet banking is an easy way for my bank's clients to conduct banking transactions.	1	2	3	4	5	6	7
My bank's clients want to be able to try Internet banking for at least one month.	1	2	3	4	5	6	7
My bank's clients want to be able to use Internet banking on a trial basis to see what it can do.	1	2	3	4	5	6	7
My bank's clients are confident over the security aspects of Internet banking in Ghana.	1	2	3	4	5	6	7
Information concerning my bank's clients Internet banking transactions can be tampered with by others.	1	2	3	4	5	6	7

Information concerning my bank's clients Internet banking transactions will be known to others.	1	2	3	4	5	6	7

8. Please indicate your agreement or disagreement with the extent to which your banks clients believe their decision to adopt Internet banking would be influenced by.

	Strongly Disagree						**Strongly Agree**
Friends	1	2	3	4	5	6	7
Family	1	2	3	4	5	6	7
Colleagues/peers	1	2	3	4	5	6	7
Media	1	2	3	4	5	6	7

9. How likely would your employer bank's clients use Internet banking if the bank charges

	Very Unlikely						**Very Likely**
If my bank charges a flat fee per month for using Internet banking.	1	2	3	4	5	6	7
If my bank charges a flat fee per month plus a fee per transaction for	1	2	3	4	5	6	7

using Internet banking.							
If my bank charges no fee for using Internet banking	1	2	3	4	5	6	7

10. Do your employer bank's clients currently have an Internet banking account with any bank?

☐ **Yes**

☐ **No**

If you answered "No" to having an Internet bank account, please continue; otherwise go to Section 3.

11. What are the main reasons why your employer's bank clients have not opened an Internet bank account yet? (Please check all that apply)

☐ Never heard of Internet banking

☐ Concerned about Security

☐ Haven't taken time to open an account

☐ Don't see any real value in having this type of account

☐ It's still too early. Would like to see how it works, then I may open an account

☐ Others…….

12. The clients of my employer's bank will be interested in using Internet banking if it is available to them. (Please indicate your responds)

Very Unlikely						**Very Likely**
1	2	3	4	5	6	7

13. How likely is it that your employer's bank clients will open Internet bank account within the;

	Very Unlikely						**Very Likely**
Next 6 Months	1	2	3	4	5	6	7
Next 12 Months	1	2	3	4	5	6	7
Next 18 months	1	2	3	4	5	6	7

14. **General and biographical information**

Please answer the following questions by ticking one of the boxes provided.

Please indicate your gender

☐ Male ☐ Female

Age

☐ 20-29

☐ 30-39

☐ 40-49

☐ 50-59

Highest Education Level

☐ Bachelor's Degree

☐ Master's Degree

☐ Doctorate Degree

☐ Others

Number of years with current employer bank

☐ 0-2

☐ 3-5

☐ 6-8

☐ 9-12

☐ Above 12

15. Please rate your bank on its success with clients' Internet banking usage

Very Poor				**Excellent**
1	2	3	4	5

Thank you very much for your participation.

Kind regards

Edem Bart Williams (Researcher) and Prof M Tait (Promoter)