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Does E-Banking Enhance Client Satisfaction in Saudi Banks?

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Abstract

This study explores e-banking variables that affect client satisfaction in the Saudi Arabian banking industry spanning three dimensions: reliability, security concerns, and efficiency, which were chosen as predictors of customer satisfaction in the e-banking industry. A field survey using a self-administered questionnaire as a data collection instrument was adopted to collect the required data from a convenience sample of 250 participants of Saudi banking customers. The overall fit of the hypothesized model was tested using linear regression to find the rate of the independent factors' impact on the dependent variable. The study's findings revealed that there is a statistically significant relationship between the three dimensions and customer satisfaction in Saudi e-banking, with the largest impact being that of reliability, followed by efficiency, and finally security concerns. Also, the study found there was a significant difference in reliability which was considered more important for Saudis and there was a significant difference in efficiency, which was considered more important by males. The findings of this study suggest that these three dimensions are instrumental in e-banking customer satisfaction and that banks can gain a competitive edge by providing better services in these dimensions to sustain and develop their performance in the increasingly globalized banking industry.

Keywords: E-Banking, Customer Satisfaction, Banking Services, Reliability, Saudi Arabia

JEL Classification Code: G4, M31, L22, L25

1. Introduction

Technology has revolutionized many areas of life over recent years, drastically increasing the efficiency and convenience of many services, including e-banking (Ejjigu, 2017). E-banking services depend on information swapping between providers and customers utilizing technological approaches without face-to-face interactions. The main advantage of e-banking is to reduce the overhead costs associated with traditional high street banking (e.g., labor and property costs) while facilitating more convenient online service delivery for customers, commensurate with changing customer lifestyles and needs. E-banking services were actively pioneered in developed countries that were the pioneers of e-services

during the early 2000s. Customers indicate a high level of satisfaction with e-services when companies provide goods or services that meet or surpass their needs (Ling et al., 2016). Consequently, e-banking can revolutionize the whole service delivery landscape for banking, significantly reducing the costs of service delivery and transactions themselves (Baber, 2019).

The banking industry has already been transformed by new innovations, and e-banking is becoming the default for banks, globally are restructuring their strategies and accommodating e-services to utilize opportunities in alignment with their strategic vision and scale boundaries (Nitsure, 2003). E-banking has mediated a transition in banking behavior closer to modern economic theories related to how the market functions. Because markets are transparent, customers have the opportunity to compare services offered by numerous banks and settle for those that satisfy their needs. Also, e-banking services worldwide, either offered online or through other means, have expanded rapidly in recent years, affecting banks, customers, and national economies and offering new business opportunities, including in developing countries. E-banking offers quick access to banking services, making them available and convenient irrespective of where

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customers are located. E-banking has reduced costs in terms of customers having to spend cash for transport to go either to ATMs or banks for banking services (Ahmad & Ali Al-Zu'bi, 2011).

In like manner, the advent of technology has made it easy to execute numerous life aspects that have played a significant role in transforming the banking industry through e-banking. The services of e-banking depend on the interchange of information between providers and consumers, utilizing technological techniques instead of having to meet in person (Hammoud et al., 2018). The main benefit of such technologies, particularly the use of digital payments in e-commerce, is to bring increased convenience for customers and reduced costs for retailers, the latter of whom may include banks. This reflects fundamental changes to people's lifestyles in the digital age, including their shopping habits and financial needs. There has been an increase in the use of e-banking services in the banking sector over recent years, and banks are utilizing the enhancements of e-banking services to attract and retain customers. Therefore, banks are making huge investments in e-banking strategies, to augment and retain a competitive advantage over their rivals (Aggarwal et al., 2021).

E-banking has brought a reduction in transaction costs, because now instead of an individual having to visit the bank to withdraw cash and go purchase a commodity, they can pay bills and purchase a product online (Amin, 2016). Also, customers can easily transfer funds from one account to another without necessarily carrying money or cheques, because the e-banking services offer funds transfer services online. Finally, the advent of e-banking has brought increased accuracy and reduced scope for error in financial transactions, because e-banking services offer instant transactions, whereby one can send or receive or pay cash instantly, without having to wait for long or use fallible intermediaries (Sleimi et al., 2020).

However, there are still many issues and challenges in using e-banking services, especially in particular contexts, such as issues concerning trust, security, human interactions, costs, and errors. Moreover, shifting banking habits might increase contactless transactions and narrow the scope for customers to engage with banks, which reduces banks' branding and advertising capabilities (e.g., thereby reducing customer awareness of their bank's full product offerings, and their loyalty to particular banks). A lack of personal relationships in e-banking is another challenge that reduces the ability of customers to compare their options and find solutions tailored to their needs (Kumar & Mokha, 2021). Finally, technical issues such as service interruptions or lack of efficiency and the stability of banking systems can influence the ability of customers to access their accounts (Cahaya & Siswanti, 2020). In like manner, no matter how sophisticated the available technology is, bank servers

might be prone to accidental or intentional downtime (Nazaritehrani & Mashali, 2020).

These debatable issues concerning e-banking motivated the current study to investigate the benefits and challenges of e-banking in Saudi Arabia, particularly exploring four factors of e-banking: reliability, client security concerns, efficiency, and customer satisfaction. Mainly on some of the challenges faced by e-banking in Saudi Arabia, and suggesting some recommendations to improve the quality of service provided at online banking. Saudi Arabia comprises a major global economy; besides from being one of the G20 economies and a regional economic powerhouse in MENA, Saudi Arabia is one of the world's main producers of oil and gas (Alnori & Alqahtani, 2019). Therefore, the results of this study can be generalized to other emerging oil-driven markets (Mirzaei & Moore, 2016). In the context of banking, Saudi banks are strategically using advancements in e-banking services to attract customers; consequently, making more investments in enhancing the latest e-banking strategies to promote customer recruitment and retention is fundamental to competitive advantage.

The rest of this study proceeds as follows. The following section reviews relevant literature to explain the background of e-banking in general and in Saudi Arabia in particular and presents the theoretical background of this research. Then, the research methodology, followed by the results, and finally the conclusion, discussion, and recommendations.

2. Literature Review

2.1. E-Banking

Electronic banking (e-banking) refers to the use of electronic channels to offer retail and small-value banking products and services by banks (Shankar & Jebarajakirthy, 2019). Such products and services offered by electronic banking include deposits, lending of funds, account management, payment of bills, provision of financial advice, and many other services (Sasono et al., 2021). These services can be delivered through internet banking, mobile banking, ATMs, debit cards, credit cards, point of sale (POS), electronic data interchange (EDI), and electronic fund transfer (EFT) by use of electronic gadgets and the internet. Numerous studies have been conducted trying to understand customers' viewpoints concerning e-banking, most of which concluded that assessing customers' viewpoints *per se* is fundamentally important for the banking industry (Kumar & Mishra, 2017).

The research conducted in some MENA counties indicated that despite regional banks having adopted online banking solutions, most customers still primarily use the traditional model of banking. Nevertheless, Hammoud et al. (2018) observed that e-banking is functional, and its impacts

on customer satisfaction exist, including the finding that the relative advantages of e-services are strongly instrumental in individuals' choices to use e-banking rather than traditional forms. They also noted that organizational performance (i.e., how banks perform in terms of offering effective and advantageous e-banking services to consumers) strongly affects customer decisions, as well as the associated issue of their customer relationships (how the banks and other financial institutions relate to their consumers in terms of offering e-banking services).

Hammoud et al. (2018) also concluded that the ease of use and simplicity of executing online transactions had a major impact on MENA e-banking customers. The banking industry has introduced many services in recent years, including e-services for wire transfers and governmental payments. Consequently, customers are now moving from traditional banking services to e-banking alternatives in response to banking innovations (Aldarabseh, 2019). On the other hand, banks are striving to attract and retain customers, and to do this they are trying to offer high-quality services to their consumers. Consumer satisfaction is one of the things that are prioritized by any form of business to ensure that it survives in the market. Therefore, for a bank to offer high-quality services to its customers, they need to offer well-organized systems and highly qualified personnel with excellent customer care (Khatoun et al., 2020).

2.2. E-Banking in Saudi Arabia

In the context of Saudi Arabia, studies of banking customer satisfaction factors include efficiency, responsiveness to customer inquiries, and reliability (Aldarabseh, 2019). Additional studies indicated that acceptable consumer satisfaction levels of Saudi banks were contrasted to due to e-banking. Customer satisfaction in the banking sector, specifically e-banking services, is highly sensitive to the impacts of tangible factors, such as transaction efficiency and fees, which are very significant in customer satisfaction, although there are other important factors like responsiveness and empathy which are also connected to customer satisfaction, albeit less significantly, which may have serious effects on customer relationships and branding over the long term. Other impacts include the firm's understanding of consumer needs. Banks conventionally focus on such factors to improve customer satisfaction in general, and in terms of the quality of their e-service provision, which is essential for sustainable growth in the increasingly competitive financial sector (Abualsauod & Othman, 2020).

The advent of modern technologies in recent decades, especially the popularization of the internet and the smartphone revolution, has brought about immense changes in business models and operations concerning consumer service in all markets, and financial institutions have been at the cutting

edge in digital e-commerce (Kumar & Shenbagaraman, 2017). Banks have found that adopting online services eliminates the overhead costs of traditional high street branches while removing barriers to customer access, such as geographical factors or long queues associated with bank halls (Tabash et al., 2019). E-banking enables quick and easy service delivery, enabling customers to execute their transactions on an anytime, anywhere basis, with maximum convenience. Banks and their customers alike benefit from the advent of new technologies through cost reduction and the flexibility of new and improved services. Specific examples of e-banking (also referred to as internet or online banking) include e-commerce purchases (buying goods online), or paying bills and fines (Hoda & Ahmad, 2019). E-banking services have become an essential aspect for a bank to remain relevant and competitive (Alawneh, 2017).

The relationship between the quality of e-banking services and consumer satisfaction centers on the dimensions of e-banking services that most affect consumer satisfaction, which is related to the technical effectiveness of services and the ways they are experienced and perceived by consumers. The factor of speed is the most vital in determining consumer satisfaction, referring to how fast customers can perform transactions using e-banking services (Ali, 2017). This is related to the efficiency of services; naturally, high speed and efficiency result in improved customer satisfaction and intention to use such services (Hammoud et al., 2018). The speed and efficiency of e-banking services are premised on their reliability, which is ultimately the most significant aspect that every customer considers when evaluating service quality (Firdous & Farooqi, 2017). Customers are also concerned about the security of e-banking (and online financial transactions in general), which relates to their privacy and the confidentiality of their data. Customers prefer e-banking services that protect their data and do not share it with unauthorized third parties or malicious and criminal attackers. Banks must ensure the high security of all customer data, particularly personal information (Addai et al., 2019).

Sathiyavany and Shivany (2018) found that reliability was the most significant factor in e-banking customer satisfaction, which mainly refers to technical reliability; customers prefer a service that they can depend on at any particular time, irrespective of their location. The second most significant factor they identified was responsiveness, as customers prefer a place where they receive a response as expediently as possible, including the timely and effective handling of problems (Toor et al., 2016). The third was assurance; customers need assurance that their funds and their personal information are in safe hands, and will not land in unauthorized hands. Finally, the relatively less important aspects of empathy and tangibles were identified, which should nevertheless be taken into consideration to improve the experience of the quality of customer service.

Al-Haliq and Al-Muhirat (2016) identified that customers in Saudi Arabia valued e-banking services, including the distribution of information concerning varying products and services that the bank provides to the general public and their specific customers. Customers also appreciated banks handling their inquiries online and responding to them, either through calls or emails, and enabling customers to request services by applying. The third service category was e-banking via a website where customers can access services that concern their accounts, including checking their balance or performing other transactions like paying bills. The fourth is that this service gives the customer a chance to utilize other banking deals and products, such as the sale and purchase of securities. Similarly, another study conducted in Saudi Arabia by Ghali (2021) identified that the most important e-banking customer satisfaction indicators among Saudi customers are ease of use, reliability, and information security (specifically the ability of the bank or financial institution to keep customers' personal information safe at all costs). Ghali (2021) also highlighted the relatively novel issue of compatibility, referring to the alignment of offered e-banking services with customers' lifestyles and needs.

An increase in the utilization of information technology enhances service delivery and also cuts costs, providing a strong impetus for banks to embrace e-banking services to remain relevant. Saudi banks are now actively embracing and promoting their e-services to attract new customers and maintain existing ones, but e-banking can affect customer satisfaction negatively when it is not implemented appropriately; banks need to provide *effective* e-banking services that attract and satisfy customers, and not just provide e-banking services *per se* (Kumar & Mishra, 2017).

A study of Saudi e-banking customers identified that the introduction of e-banking enabled customers to easily manage their finances in the comfort of their gadgets without having to go to banks in person; Aldarabseh (2019) identified that customers particularly valued services tailored to satisfy their needs, such as account detail inquiries, and paying bills (e.g., for public services) and fees, subscription activations, and new financial or product applications. These high-demand services must be prioritized by banks, who must offer high-quality and effective service delivery for particular products and features catering to related needs. Tailored service delivery enables banks to maintain their competitive advantage and enhance customer perceptions of the quality of services and satisfaction (Puri-Mirza, 2020). E-banking factors that particularly affect customer satisfaction include the design of the financial institution's website, responsiveness, reliability, personalization, trust, empathy, and assurance. Modern banks must prioritize addressing customer satisfaction and particularly avoid customers feeling disappointed with e-products from banks (Buddhika & Gunawardana, 2020).

Saudi Arabia's banking industry has moved very fast to implement e-banking. One of the major drives to implement e-banking is to provide easier, faster, and more reliable services to clients that meet their demands (Shankar & Jebarajakirthy, 2019), to venture into new markets, reduce operational, administrative, and labor costs, and increase competitiveness in a fast-growing technology environment. The Government's initiative to promote e-commerce in the Saudi Kingdom also played a key role in the adoption of e-banking (Al-Haliq & Al-Muhirat, 2016).

E-banking has benefited many customers in Saudi Arabia, including both locals and expatriates, in many ways. Transparency has been greatly encouraged by e-banking through the use of digital payment systems, and e-banking allows access to bank services 24/7 from anywhere through internet banking, which is particularly advantageous to people who may face geographical or socio-cultural barriers or inhibitions to accessing conventional high street banks (e.g., rural Bedouins and women) (Al-Haliq & Al-Muhirat, 2016). Customers have also been able to get updated with banking transactions and any changes in terms and conditions in the form of alerts and notifications courtesy of e-banking. Convenience is also one of the biggest benefits that bank customers in Saudi Arabia, who all benefit from not having to access banks during the intense heat of conventional working hours. Furthermore, e-banking has significantly reduced transaction costs for Saudi customers.

2.3. Variables Selection

2.3.1. Overview

E-banking services span many products and features offered by financial institutions to their customers, whose uses have increased exponentially since the beginning of the century, bringing immense convenience in terms of anytime-anywhere access, and much quicker and more convenient execution of banking tasks, as explained in detail above. The *reliability* (RB) of such services is inherently pertinent to customer satisfaction.

The great advantages of convenience and ubiquity offered by e-banking come with new forms of risks, particularly concerning potential misuse or breaches of customer data (Hareendran, 2019). To promote customer trust, and prevent the misuse of data, advanced computerized authentication techniques are applied for user identity verification, and computer scientists continually develop new forms of protection to safeguard customers (and banks) from emerging cyber threats (Nagar & Ghai, 2019). Nevertheless, the security of e-banking services remains a core concern of customers, and e-banking providers continually seek to develop suitable measures to counter vulnerabilities to make e-banking more credible.

Banking through the internet enhances the way one observes their business' finances as it eases the monitoring of deposits and payments on demand. However, the simplicity of accessing financial accounts through e-banking has become a major target for online criminals who use hackers to conduct their acts (Laverty, 2019). Understanding and addressing the *security concerns* (SEC) associated with internet banking can assist individual to keep their both business and personal accounts in a safe space away from intruders.

E-banking can be used to conduct all payments and transactions via the Internet, through credit unions, building societies, and banks' websites (Jolly, 2016). The more e-banking developed, the more consumers got banking freedom and convenience, as they can bank at any place or time with internet access and a computer using a web browser to do online transactions. E-banking was used as a communication and advertising medium by banks when it was first established, but the development of ever-advancing technologies enabled the unprecedented enhancement of online transactions, making them more economical and safer. When each new day came, banks kept on adding more services and also improving the *efficiency* (EF) of performing banking transactions. At the current juncture, banks cannot operate without e-banking services, and the banks incur low costs in maintaining and developing tools used in online banking, which enables banks to give their customers more efficient services at a cheaper cost.

Services are a significant aspect of every economy in the same way they are a vital part of our day-to-day lives. The introduction of technology has calibrated services by diminishing the employee-customer workflow. In the banks' cases, they all share a common ground which is financial services (Ejigu, 2017). Therefore, the only way a bank will stand out is by providing the best services to meet consumer demand, seeking to achieve *customer satisfaction* (CS), given that most customers prefer services that are technology-based, like internet and mobile banking, because of their convenience (Ling et al., 2016). This makes it clear that e-banking is the most effective and efficient banking method that consumers prefer to use.

Consequently, this study mainly focuses on the role of the *reliability* (RB), *security concerns* (SEC), and *efficiency* (EF) of e-banking in relation to *customer satisfaction* (CS) with e-banking services, as explained below.

2.3.2. Reliability (RB)

E-banking has been in existence for some time now and it has gained popularity because of the convenience it gives to its customers. By use of e-banking, consumers can execute tasks such as confirming account balances, checking personal details, transferring funds, and making

payments (Hareendran, 2019). However, the services came with setbacks, such as cyber-attacks which include social engineering and espionage, as explained in the following subsection. Due to the revolution of the banking sector through information technology banks have improved the infrastructure by implementing reliable approaches to manage risks involved in online transactions. Thus, RB is an essential aspect of technology-based financial services, and for financial institutions to remain relevant in the competitive environment of their industry they need to continue enhancing e-banking services and for financial institutions to remain relevant in the competitive environment of their industry they need to continue enhancing e-banking services (Nagar & Ghai, 2019).

2.3.3. Security Concerns (SEC)

Consumers are very wary of the potential dangers of online transactions, particularly when using their bank accounts, and they are generally aware of the mechanisms put in place to safeguard them during e-commerce activities and online banking, and of conventional actions, they can take to keep their information and accounts safe. The most fundamental measure is the user password or access code, and automated systems nowadays generally compel customers to choose sophisticated passwords that include mixed-case letters and numbers, to reduce the chances of casual hacking (Laverty, 2019). A more insidious risk to e-banking consumers than account hacking is phishing, whereby consumers are deceived into disclosing the information necessary to access their accounts. This may be achieved by conventional email or telephone scams, or by advanced impostor attacks, whereby criminals can imitate official bank emails and/ or websites to fool customers into disclosing the information necessary to access their accounts.

Banks are limited to promoting customer awareness to avoid such attacks, as they are not involved in the loop in which phishing attacks occur. Many banks invite customers to report phishing attempts, whereupon they alert the relevant law enforcement authorities and issue warnings. Blanket policies are the main active step banks take to avoid phishing, such as repeatedly informing customers that they will never send emails asking for account information, passwords, pins, etc. Nevertheless, phishing remains a prominent SEC issue that can deeply affect customer confidence (Laverty, 2019).

2.3.4. Efficiency (EF)

Younger people tend to be more eager adopters of new technologies, and customers' ages play a very significant role in the use of e-banking services. Preferences also vary among different age groups to reflect different consumer interests that inherently vary by age, reflected in different

activities such as using e-banking to pay bills online or apply for various types of loan, alongside universal customer behavior such as viewing online account information (Jolly, 2016). There is also a relationship between saving costs by bank customers and an adopted banking method; customers perceive that e-banking usually saves them money and time because they can perform a transaction at any particular place and time, which means that they save on up-front costs such as transport charges or wasting time going to high street banks (Asiyanbi & Ishola, 2018).

Therefore, e-banking gives customers the convenience they need because it is user-friendly due to numerous reasons. Conducting transactions through e-banking is an efficient mode of banking from a financial perspective. This is because it reduces expenses both for the bank and the consumers. If viewed from the customer's perspective, the main charges it omits are related to the time and expense of transport incurred by going to traditional bank branches (Jolly, 2016). Also, the facilities offered by e-banking are important to customers. As e-banking continues developing and gaining popularity, banks need to advance their services to continually increase EF.

2.3.5. Customer Satisfaction (CS)

For online banking to be profitable to financial institutions they must attract and maintain customers and generate the necessary volume of transactions and sales. Customer loyalty is assured by providing optimum services that meet customer needs, and the quality of service banks offer – as perceived and actualized by customers – can be assayed and studied by measuring e-banking activities among consumers, and actively studying the dimensions of CS by means of customer surveys, as undertaken in this study (Ejigu, 2017). This is a major condition for the functional management of quality. The fundamental determinant of e-banking quality is meeting (or exceeding) the expectations and demands of consumers, aside

from providing optimum and functional technical capabilities (which may be problematic for banks, but which are to be taken for granted by customers). The main dimension that also determines CS is assurance because customers need a service that is sure in terms of provision. Therefore, assurance in CS in e-banking is a significant aspect.

Another aspect is speed and convenience, which relate directly to CS in e-banking. Most customers prefer using internet banking services primarily because of their convenience and speed, as explained extensively above (Ling et al., 2016). Internet banking gives customers convenience in terms of cost-cutting, and the speed and ease of transactions satisfy customers. Therefore, financial institutions should always focus on enhancing the speed and convenience of e-banking services. Security and privacy are also core aspects of e-banking CS, as discussed previously.

3. Research Method

This part provides an outline of the research methodology used in this study. A deductive approach was followed, whereby hypotheses derived from existing literature were tested and validated. The reviewed literature indicated that many researchers used quantitative approaches to conduct similar research. Thus, this explanatory research follows the quantitative method, depending on a questionnaire as a data collection method. The research tool was tested and was found to be reliable and valid (as discussed below). The data analysis methods consisted of computing descriptive statistics and inferential statistics (Bhattacharjee, 2012).

3.1. Framework of Factors

The research analyzes the impacts of e-banking RB, SEC, and EF on CS in Saudi Arabia (Ahmad & Al-Zu'bi, 2011; Alawneh, 2017; Ali, 2017; Abualsauod & Othman, 2020). The model is summarized in Figure 1. To test the



Figure 1: Research Conceptual Model

hypotheses developed based on the literature review, where this study statistically analyzes primary data derived from a quantitative Likert-type questionnaire, which was designed based on previous studies (Hammoud et al., 2018; Hoda & Ahmad, 2019; Asiyanbi & Ishola, 2018).

3.2. Research Hypotheses

H1: E-banking reliability influences customer satisfaction.

H2: E-banking security concerns influence customer satisfaction.

H3: E-banking efficiency influences customer satisfaction.

3.3. Research Approach and Design

The selected approach for this study was a deductive and cross-sectional quantitative research design, using a scale-based method. The design is used to gather information and aid in forming a broad and solid understanding of the extent of the research problem. Primary data was obtained from electronic questionnaires that were distributed in English and Arabic. The former is the second language widely spoken by most expatriates residing in Saudi Arabia, while the latter is the national language.

3.4. Population and Sampling Method

A field survey using a self-administered questionnaire as a data collection instrument was adopted to collect the required data from a convenience sample of 250 participants of Saudi banking customers (Sudiyanti, 2009). The probability sampling technique could avoid some issues such as results generalizability and sampling bias (Bhattacharjee, 2012), Saudi banking system never allows information such as addresses, contact numbers, and emails to be given regarding their customers. Consequently, the convenience sampling technique was adopted as a more appropriate technique for the population of the current study (Castillo, 2009; Dwivedi et al., 2006). This study was conducted over the period between January 2022 and October 2022 to avoid any impact of Covid-19. Security and privacy were derived from (Vijayarathy, 2004). The translation of the questionnaire from English to Arabic (since Arabic is the language spoken in Saudi Arabia), was done using the back-translation technique developed by Brislin (1976). Then, the questionnaire (i.e. Arabic version) was judged by a panel of experts at the department of finance department -King Abdulaziz University- who is fluent in both Arabic and English (Dwivedi et al., 2006). After that, a pilot study with 35 graduate students in the finance department was conducted to see if there were any issues regarding the language used as well as to test the

factors' reliability (Dwivedi et al., 2006). the outcomes of participants of the pilot study mentioned that the language is clear and there are no vague sentences.

3.5. Research Tools

The primary instrument used was a questionnaire designed and written by reviewing the literature and adjusted by a panel of experts. The questionnaire comprised two sections:

1. Section one: concerns the socio-demographic characteristics of respondents, including their nationality, gender, occupation, educational level, age, and main bank.
2. Section two: this comprised four parts concerning the main variables of the study, comprising a total of 29 questions (RB, N = 7; SEC, N = 8; EF, N = 8; AND CS, N = 6), answerable using a five-point Likert scale.

3.6. Reliability and Validity

This section outlines the validity and reliability of the study questionnaire, indicating its consistency. A pilot study was initially conducted by distributing the questionnaire to a small number of individuals (i.e. 35 graduate students) to test the tool's reliability. Cronbach's alpha (α) coefficient was used to determine the internal consistency of each measurement, whereby values ranges from 0 to 1, with higher values indicating higher consistency (Comrey & Lee, 1992). The sample provides values ranging from 0.813 to 0.917, indicating good to excellent internal consistency and demonstrating the reliability of the study tool.

Second, to test the validity of a measure, which indicates the extent to which it would generate the same result from one occasion to another, the reliability was re-tested for the overall participants; where the Cronbach's alpha values for scales ranged from 0.806 to 0.916; these values are indicators of good to excellent reliability, thus the scales used for this study were considered reliable and valid.

3.7. Data Analysis Method

Statistical analysis was undertaken using SPSS (22.0) software to analyze the collected quantitative data, identify relationships between variables and their statistical significance, and test the research hypotheses. Data analyses consisted of computing descriptive statistics in the form of frequency distributions and indicators of central tendencies (means) and variability (standard deviations), with inferential statistical analysis undertaken as follows:

1. Weighted mean of each scale (e-banking RB, SEC, EF, and CS) by Likert scale questionnaire responses.
2. *T*-test for parametric descriptive and Mann-Whitney-test for non-parametric investigation of factors regarding dual demographic information (i.e. nationality and gender).
3. One-way analysis of variance (ANOVA) for parametric description, and Kruskal Wallis test for non-parametric (to study factors regarding additional customer information, such as occupation and main bank).
4. Spearman correlation coefficient, to study relationships factors and socio-demographic characteristics.
5. Pearson correlation coefficient, to study the relationships between factors themselves, and to accept or reject the research hypotheses.
6. Multiple linear regression, to study the overall fit of the hypothesized model, and to find the rate of factors' effects on others.

4. Results

This section presents the results in a logical sequence, describing participants' socio-demographic information, assessment of study factors, factors variation in relation to demographic characteristics, and testing of the study hypotheses and equation modeling.

4.1. Reliability (RB)

RB was evaluated by asking respondents seven questions covering different aspects, such as customer preferences in using e-banking instead of visiting a branch, charges of e-banking services, and the working order of the e-banking

channels system. The results shown in Table 1 indicate that respondents had positive perceptions of the reliability of e-banking ("use of e-banking is reliable"). Thus, the result indicates that using e-banking channels is preferable to visiting the branch. Moreover, most respondents were satisfied with the "charges of e-banking services", and generally experienced ATMs to be in working order. Respondents rarely faced any issues concerning the "first-time performance of e-banking service", and 177 out of 250 considered that their e-banking service channels and banking apps were in "working order". Thus, it can be concluded that banks have efficient maintenance and working order of their e-banking channels and apps on smartphones to encourage their clients to use e-banking platforms rather than the traditional way of visiting the branch to conduct their transactions. The overall results indicated that customers agreed with the RB of e-banking (mean \pm SD = 3.95 \pm 0.57). Also, observed deviations from the answers to each question were very small, thus the standard deviation indicated that there was no distraction in respondents' opinions for each question.

4.1.1. Security Concerns (SEC)

The results of items assessing the respondent's concerns about the security of e-banking channels are displayed in Table 2. It can be seen that most felt secure when conducting online transactions and felt that bank employees had a good level of knowledge of the security system. Moreover, as indicated by responses for statements concerning e-banking sites "not sharing personal info", "security devices services protection", "security of e-banking from fraud and hacking", and "high protection for banking transactions", most respondents felt secure about banks handling and protecting their data. The overall assessment indicated that respondents "agree" in terms of their satisfaction with the

Table 1: Evaluation of E-Banking Reliability

Statement	STD	D	N	A	SA	Total	Mean	SD
The use of e-banking is reliable	0.0%	3.0%	11.4%	53.9%	31.7%	250	4.14	0.73
Use of e-banking instead of branch visiting	1.8%	4.2%	6.0%	22.8%	65.3%	250	4.46	0.91
Satisfaction with e-banking charges	4.2%	9.0%	31.1%	41.3%	14.4%	250	3.53	0.98
ATM working order	3.0%	7.2%	25.7%	51.5%	12.6%	250	3.64	0.90
First-time performance of service	1.2%	1.8%	13.8%	61.7%	21.0%	250	3.99	0.74
E-banking service in working order	0.6%	4.8%	13.8%	60.5%	20.4%	250	3.95	0.77
Working order of app on smartphones	0.6%	5.4%	18.0%	50.9%	25.1%	250	3.95	0.84
Overall	1.6%	5.0%	17.1%	48.9%	27.2%	1,750	3.95	0.57

Note: Values are reported as frequencies, percentages, and mean \pm SD. Abbreviations: SD = Standard Deviation, STD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.

Table 2: Evaluation of E-Banking Security Concerns

Statement	STD	D	N	A	SA	Total	Mean	SD
Feeling secure in online transactions	0.0%	6.0%	12.0%	62.9%	19.2%	250	3.95	0.74
Bank employees have high knowledge of e-banking	3.0%	7.2%	25.7%	48.5%	15.6%	250	3.67	0.93
E-banking employees give confidence	1.8%	0.6%	19.2%	59.9%	18.6%	250	3.93	0.75
E-banking sites do not share personal info	0.0%	0.6%	21.0%	49.1%	29.3%	250	4.07	0.72
E-banking services secure the personal privacy	0.0%	0.0%	13.2%	56.9%	29.9%	250	4.17	0.64
E-banking security devices have service protection	0.0%	0.6%	12.6%	61.7%	25.1%	250	4.11	0.62
Security of e-banking from fraud and hacking	1.8%	10.2%	25.1%	47.9%	15.0%	250	3.64	0.92
High protection for banking transactions	0.6%	2.4%	16.2%	61.7%	19.2%	250	3.96	0.71
Overall	0.9%	3.4%	18.1%	56.1%	21.5%	2000	3.94	0.51

Note: Values are reported as frequencies, percentages, and mean \pm SD. Abbreviations: SD = Standard Deviation, STD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.

security of e-banking channels (mean \pm SD = 3.94 \pm 0.51). The deviations in the answers for each question were very small, thus indicating that there was no distraction in the respondents' concerns.

4.1.2. Efficiency (EF)

The results of items to measure respondents' evaluation of EF are reported in Table 3. It can be seen that respondents indicated strong overall agreement concerning EF (mean \pm SD = 4.24 \pm 0.54). It is evident that respondents were highly satisfied with most aspects of EF, such as speed of service, transaction speed in e-banking channels, ease of use and learning, service language provision, e-banking clearance, platforms being understandable, and flexibility. The strongest satisfaction was for the time-saving nature of e-banking services (mean = 4.66).

4.1.3. Customer Satisfaction (CS)

The responses to items evaluating customers' level of satisfaction with e-banking services indicate that the overall indications were to "agree" (mean \pm SD = 4.13 \pm 0.67). The deviations in the answers for each question were very small, thus indicating that there was no distraction in the respondents' satisfaction. The overall values statically indicate that more than 80% (49.3% + 34.4%) of respondents answered *agree* and *strongly agree* with items concerning their satisfaction with the e-banking services provided to them, while a small proportion (4.9%; 0.7% + 4.2%) were *strongly unsatisfied* and *unsatisfied*. These findings show that most bank clients are satisfied with e-banking online service and transaction processing quality.

4.2. Assessment of Outcomes by Nationality, Gender, Occupation, and Bank

To explore potential demographic variations in customers' assessments of the main e-banking factors explored in this study, *T*-test and one-way ANOVA were used to explore potential distinctions, after checking the data homogeneity. Otherwise, alternative non-parametric tests (Mann–Whitney and Kruskal–Wallis) were used (for non-homogenous data).

First, a *T*-test was utilized to assess the main factors of the study according to nationality, as shown in Table 4. There were no significant differences for SEC, EF, and CS according to nationality, since *P* values were more than 0.05, but there was a significant difference for RB since *P* values were less than 0.05 (i.e., RB was more significant for Saudis).

A *T*-test was also used to explore variation according to gender, as shown in Table 4. The results indicated that there was no significant difference for RB, SEC, and CS according to gender since *P* values were more than 0.05. However, there was a significant difference for EF, since *P* values were less than 0.05 (i.e., EF was more significant for males).

Second, one-way ANOVA and Kruskal–Wallis tests were used to identify the different assessments of the main factors of the study according to the occupation. The results indicated that there were no significant differences for any of the variables (RB, SEC, EF, and CS) according to occupation since all of the associated *P* values were greater than 0.05.

Finally, Kruskal–Wallis test and one-way ANOVA were used to identify the different assessments of the main factors of the study according to customers' banks. The results indicated that there were significant differences for RB, EF, SEC, and CS according to the bank.

Table 3: Evaluation of E-Banking Efficiency

Statement	STD	D	N	A	SA	Total	Mean	SD
The use of e-banking services is time-saving	4.2%	9.0%	31.1%	41.3%	14.4%	250	4.66	0.98
The service delivered through e-banking services is quick	1.8%	4.2%	6.0%	22.8%	65.3%	250	4.46	0.91
I can quickly complete any transaction through e-banking service channels	4.2%	9.0%	31.1%	41.3%	14.4%	250	3.53	0.98
I found that e-banking services are easy to use	3.0%	7.2%	25.7%	51.5%	12.6%	250	3.64	0.90
E-banking services are provided in various languages	1.2%	1.8%	13.8%	61.7%	21.0%	250	3.99	0.74
Learning to operate the e-banking system is easy for me	1.8%	10.2%	25.1%	47.9%	15.0%	250	3.64	0.92
My interaction with the e-banking system is clear and understandable	0.6%	5.4%	18.0%	50.9%	25.1%	250	3.95	0.84
I find the e-banking system to be flexible to interact with	0.6%	5.4%	18.0%	50.9%	25.1%	250	3.95	0.84
Overall	1.6%	5.0%	17.1%	48.9%	27.2%	1,750	4.24	0.54

Note: Values are reported as frequencies, percentages, and mean \pm SD. Abbreviations: SD = Standard Deviation, STD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.

Table 4: Comparison of E-Banking Reliability, Security Concerns, Efficiency, and Customer Satisfaction According to Nationality and Gender

Variables	Nationality	N	Mean	SD	t(165)	P value
Reliability	Saudi	233	3.98	0.56824	2.175	0.031*
	Non-Saudi	17	3.61	0.56613		
Security	Saudi	233	3.94	0.51689	0.294	0.769
	Non-Saudi	17	3.89	0.52504		
Efficiency	Saudi	233	4.25	0.53323	0.344	0.732
	Non-Saudi	17	4.19	0.69188		
Satisfaction	Saudi	233	4.14	0.67041	1.111	0.268
	Non-Saudi	17	3.92	0.72052		
Non-Homogeneous Variable	Gender	N	Mean	Mean Rank	Mann-Whitney	P value
Reliability	Male	168	3.97	86.26	0.822	0.385
	Female	82	3.89	79.39		
Homogeneous Variables	Gender	N	Mean	SD	t(165)	P value
Security	Male	168	3.95	0.49	0.192	0.848
	Female	82	3.93	0.55		
Efficiency	Male	168	4.34	0.45	3.491	0.001**
	Female	82	4.04	0.66		
Satisfaction	Male	168	4.13	0.68	0.139	0.889
	Female	82	4.12	0.67		

Note: Values were reported as mean \pm SD and analyzed by t-test. N = number of participants, SD: standard deviation, *Statistically Significant ($p \leq 0.05$).

4.3. Assessment of Outcomes by Customers’ Age and Educational Level

The relationships between the studied variables (RB, SEC, EF, CS) and customers’ age, education level, and experience were initially assessed utilizing Spearman correlational analyses. The results shown in Table 5 indicate that there was no significant association between customers’ (1) age and (2) educational level and their opinion about banking RB, SEC, EF, and CS.

4.4. Hypotheses Testing

To study the relationship between the main studied factors (RB, SEC, and EF) as independent variables that may directly affect CS (the dependent variable), the Pearson correlation coefficient was used. Table 6 shows the significance level and correlation coefficients to accept or reject the overall hypothesized model.

H1: *E-Banking Reliability Influences Customer Satisfaction.*

The association between (RB) and (CS) as depicted in Table 19, showed a highly significant association (p -value = $0.00 < 0.01$), and the relationship was a positive moderate

correlation ($r = 0.68$). Consequently, RB has a positive influence on CS, and H1 is accepted.

H2: *E-Banking Security Concerns Influence Customer Satisfaction.*

The results showed a highly significant association between SEC and CS (p -value = $0.00 < 0.01$), and this relationship is a positive, moderate correlation ($r = 0.58$). Consequently, SEC has a positive influence on CS, and H2 is accepted.

H3: *E-Banking Efficiency Influences Customer Satisfaction*

The results showed a highly significant association between EF and CS (p -value = $0.00 < 0.01$), and the relationship is a positive moderate correlation ($r = 0.62$). Consequently, EF has a positive influence on CS, and H3 is accepted.

4.5. Equation Modeling

The overall fit of the hypothesized model was tested using linear regression to find the rate of the independent factors’ impact on the dependent variable. Table 6 shows that

Table 5: Correlations Matrix

	Satisfaction	Efficiency	Reliability	Security	Education	Age
Satisfaction	1.000					
Efficiency	0.617**	1.000				
Reliability	0.639**	0.657**	1.000			
Security	0.472**	0.576**	0.582**	1.000		
Education	0.093	0.037	0.147	-0.033	1.000	
Age	0.097	-0.003	0.004	-0.047	0.162*	1.000

Note: * p -value < 0.1 ; ** p -value < 0.05 ; *** p -value < 0.001 . Significant at the 0.05 level.

Table 6: Multiple Linear Regression for the Impact of E-Banking Reliability, Security Concerns, and Efficiency on Customer Satisfaction

Independent Factors	B	Std. error	t	P-value	R	R square
(Constant)	-0.103	0.316	-0.327	0.744	0.739	0.546
Reliability	0.471	0.086	5.465	0.000		
Security	0.282	0.089	3.175	0.002		
Efficiency	0.297	0.089	3.320	0.001		

Note: The linear equation model can be rendered as follows: $Y = B + a_1 X_1 + a_2 X_2 + a_3 X_3 + SE$; Customer satisfaction = $B + a_1$ Reliability + a_2 Security + a_3 Efficiency + SE; Customer satisfaction = $-0.103 + 0.471 (3.95) + 0.282 (3.94) + 0.297 (4.24) + 0.316 = 4.33 + 0.316 = 4.64$.

the total correlation was ($R = 0.74$, R square = 0.55). This indicates that RB, SEC, and EF had a 55% impact on CS, and RB had the highest impact, followed by EF, and then SEC. Figure 2 shows the multiple linear regression for the impacts of RB, SEC, and EF on CS.

4.6. Summary of Results

- Customers agreed about the role of RB and SEC on CS and strongly agreed about the role of EF.
- There were no significant differences concerning views on the SEC and EF of e-banking and CS according to nationality, while there was a significant difference for RB (it was considered more important for Saudis).
- There were no significant differences in attitudes toward the roles of RB and SEC in CS according to gender, while there was a significant difference for EF (which was considered more important by males).
- There were no significant differences in attitudes toward the roles of RB, SEC, and EF in CS according to occupation.
- There were no significant differences in attitudes toward the roles of RB and EF in CS according to the bank.
- There were no significant associations between customers' age and their CS in relation to RB, SEC, and EF. Also, there was no significant relationship between education level and their opinion about bank RB, SEC, EF, and satisfaction.

- There were no significant associations between customers' educational level and their CS in relation to RB, SEC, and EF.
- There was a moderate positive relationship between RB and CS.
- There was a moderate positive relationship between SEC and CS.
- There was a moderate positive relationship between EF and CS.
- Overall, the factors exerted a 55% influence on CS, with RB having the greatest impact, followed by EF, and finally SEC.

5. Conclusion

E-banking has improved the quality of banking services as perceived by customers in Saudi Arabia. The main reason for this is that it circumvents the traditional requirement for banking employees and customers to meet face-to-face to execute banking transactions; consequently, costs are reduced for service providers and consumers. The internet has redefined the banking industry, and now one can perform any form of transaction irrespective of time or location.

Customers in Saudi Arabia are generally happy with e-banking services in terms of RB, SEC, and EF, according to the statistical analysis undertaken in this paper. The study's main result is that when each independent variable is analyzed separately, it has a relationship with the dependent

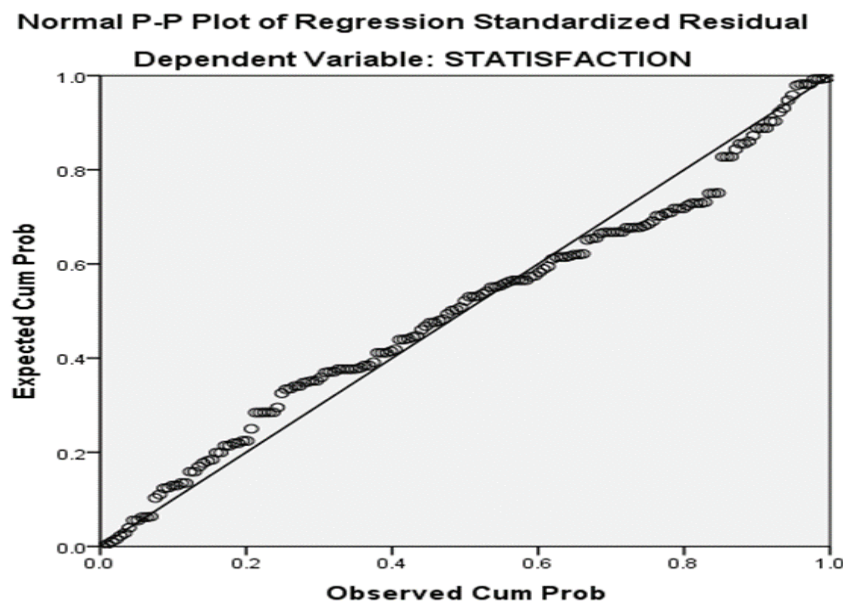


Figure 2: Multiple Linear Regression for the Impact of E-Banking Reliability, Security Concerns, and Efficiency on Customer Satisfaction

variable. The findings also lead us to the conclusion that citizens in Saudi Arabia judge e-banking satisfaction in terms of the main dimensions of RB, SEC, and EF. However, the majority of people benefit from just a few simple e-banking operations in Saudi Arabia, such as cash withdrawals from ATMs, account inquiries, and so on. Another consideration is that the benefit earned from the service is valued more than the outlook of the facilities that provide it.

Based on the study findings, the following recommendations are suggested: (i) decrease charges of transactions through e-banking channels to gain higher CS, (ii) increase insurance coverage for fraud and hacking, and refund money in less time, (iii) generalize the study's findings, more studies with a larger sample size should be conducted, (iv) bank-specific studies, such as private and public banks, or local and foreign banks, can yield more conclusive results on CS in Saudi Arabia's e-banking market, and (v) other e-banking service variables that influence CS may be added for further investigation.

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