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Factors Affecting Electronic Banking Adoption in Barbados

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Walden University
2020

Abstract

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by

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MBA, University of Leicester, 2014

BCOMM, Nipissing University, 2007

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Abstract

The low rate of customers' adoption of electronic banking services affects retail banks' profitability. The operating cost for a financial transaction performed by bank tellers averages US$1.07 compared to US$0.01 using electronic banking channels. It is paramount for retail banking leaders to understand the factors influencing customer adoption of electronic banking to sustain competitive advantage. Grounded in the technology acceptance model framework, the purpose of this quantitative correlational study was to examine the relationship between perceived usefulness (PU), perceived ease of use (PEOU), and customer adoption of electronic banking in Barbados. The validated technology acceptance model survey instrument was used to collect 72 responses from bank account holders living in Barbados who owned a mobile smartphone or a computer and used electronic banking services (mobile or online banking). A multiple regression analysis confirmed that the model as a whole was able to significantly predict customer adoption of electronic banking services: $F(2, 69) = 123.503$, $p < .001$. Both PU and PEOU were statistically significant with PEOU ($t = 6.249$, $p < .01$, $\beta = .574$) accounting for a higher contribution to the model than PU ($t = 3.883$, $p < .01$, $\beta = .357$). A key recommendation is that retail banking leaders provide customers with educational resources to aid in increasing their usage of electronic banking services. The implications for positive social change include an improved understanding of electronic banking services to residents, increased awareness of the availability of electronic banking services to retail banking customers, and expanded access to affordable financial services for individuals in Barbados.

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Dedication

My favorite quote is "the sky is the limit," but I cannot do it alone! Successful completion of this doctoral study is proof of that fact, so I would like to dedicate this work to God, who gives me the strength to do all things possible. I also dedicate this study to my children and cheerleaders, Shanique and Shano, who encouraged me to pursue my life-long goal and rewarded me when I took the leap of faith to start the degree. You cheered me on when I felt overwhelmed with competing priorities and celebrated each milestone with me along the journey. To my mother, Brenda Watson, for her continuous support and prayers, thank you so much! To my siblings, Kayrene, Gregory, Beverley, Nigel, and Kenville, I rarely saw you, but thank you for keeping in touch! To my church family at Christ is the Answer Family Church and ministry group, Daughters of Worship International, who prayed me through each day and shouldered some of my responsibilities while I studied, thank you! Finally, I dedicate this study to Fitzroy Bardouille, my coach, friend, and mentor, for your unwavering support, guidance, and encouragement; you kept me focused on the destination! Thank you all!

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This achievement was possible because of the reliable support system behind me! I thank God for keeping me in good health, strength, and will. To my chair, Dr. Deborah Nattress, I thank you for keeping me focused throughout my dissertation, for your leadership, encouragement, and sharing your personal experiences to show that I was not alone when I felt overwhelmed. To my SCM, Dr. Roger Mayer, for your direction and support, thank you! To my URR, Dr. David Moody, for your critique and encouragement that helped me to produce quality work, thank you! I would also like to thank my program director's representative, Dr. Al Endres, for supporting my work.

I acknowledge and thank my colleagues from the 8100 and 9000 courses and faculty from previous courses for their valuable feedback. To the Writing Center staff, especially Claire who challenged me to take my writing skills to the next level with each submission, thank you! To other family members, friends, and work colleagues who have helped me in various ways along this journey, a sincere thank you!

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Section 1: Foundation of the Study

Electronic banking or e-banking is an alternative concept to traditional banking that researchers claim is advantageous to both banks and their customers (Patel & Patel, 2017). Bank leaders promote e-banking to reduce operating expenses, create efficiency, and promote customer retention, whereas customers enjoy the convenience, accessibility, and availability (Patel & Patel, 2017). As a developing country, Barbados is in its infancy stages of electronic banking and bank leaders are faced with challenges to convert a culture of cash intensive banking to a cashless environment.

Background of the Problem

In recent years, innovation technology advances in the banking industry created a paradigm shift from traditional branch-based banking to electronic or e-banking services (Mishra & Singh, 2015; Rad, Rasoulian, Ali, Mahmoad, & Sharifipour, 2017; Sanchez-Torres, Canada, Sandoval, & Alzate, 2018). Akhisar, Tunay, and Tunay (2015) noted that retail banking leaders could eliminate 40% percent of the branch-based transaction costs if they transitioned customers to lower-cost e-banking services. Retail banking leaders, therefore, sought to develop strategies to promote e-banking services to increase profitability and sustain competitive advantage, however the customer adoption rate remained low (Akhisar et al., 2015; Belas, Koraus, Kombo, & Koraus, 2016). My doctoral research study provided strategies to help retail banking leaders in Barbados understand the relationship between perceived usefulness (PU), perceived ease of use (PEOU), and customer adoption of electronic banking services. The study also provided a

predictive model to help retail banking leaders in Barbados reduce high-cost branch-based transactions with the adoption of lower-cost electronic banking services.

Problem Statement

The low rate of customers' adoption of e-banking services affects retail banks' profitability (Mansour, 2016). The operating cost for a financial transaction performed by bank tellers in 2011 totaled US$1.07 compared to US$0.01 using e-banking channels (Chandio, Irani, Zeki, Shah, & Shah, 2017). The general business problem was that banks lose money when customers do not use e-banking services. The specific business problem was that some retail banking leaders in Barbados do not understand the relationship between perceived usefulness (PU), perceived ease of use (PEOU), and customer adoption of e-banking services.

Purpose Statement

The purpose of this quantitative correlational study was to examine the relationship between PU, PEOU, and customer adoption of e-banking services in Barbados. The predictor variables were PU and PEOU. The dependent variable was e-banking adoption. The target population was retail banking customers in Barbados with access to smartphones, tablets, laptops, or desktop computers who had at least one bank account. The implications for social change included the potential to provide an improved understanding of e-banking services to Barbadian residents, to increase awareness of the availability of e-banking services to retail banking customers in Barbados, and to create access to affordable financial services for individuals in Barbados.

Nature of the Study

Researchers use three methods to conduct their studies: (a) quantitative, (b) qualitative, and (c) mixed methods (Fricker, 2016). According to Saunders, Lewis, and Thornhill (2015), researchers use a quantitative methodology to examine the relationships between variables and apply closed-ended questions to test hypotheses. In this study, I used a quantitative method because I intended to examine the possible relationship between two independent variables (PU, PEOU), and one dependent variable (electronic banking adoption). Researchers adopt a qualitative methodology to explore a central phenomenon and gather information using open-ended questions (Rutberg & Bouikidis, 2018). I did not attempt to explore a central phenomenon; therefore, a qualitative method was not appropriate for this study. Mixed method researchers adopt both quantitative and qualitative methodologies in a single study (Saunders et al., 2015; Yin, 2018). I did not use a mixed method approach because I did not require qualitative data in this study.

I chose a correlational design for this study. Researchers use correlations to examine the relationship between two or more variables (Saunders et al., 2015). The correlational design was appropriate for this study because the purpose of the study was to examine the relationship between a set of predictor variables and a dependent variable. I did not choose experimental or quasiexperimental designs because they are appropriate when researchers attempt to assess a degree of cause and effect (Rutberg & Bouikidis, 2018; Saunders et al., 2015). The primary objective of this study was to examine the correlational relationship between predetermined variables; therefore, the experimental or quasiexperimental designs were not appropriate for this study.

Research Question

RQ: What is the relationship between PU, PEOU, and customer adoption of electronic banking in Barbados?

Hypotheses

H_0: There is no statistically significant relationship between PU, PEOU, and customers' adoption of e-banking services.

H_1: There is a statistically significant relationship between PU, PEOU, and customers' adoption of e-banking services.

Theoretical Framework

Davis (1986) developed the technology acceptance model (TAM) as an extension of the theory of reasoned action (TRA) previously proposed in 1975 by Fishbein and Ajzen (Illia, Ngniatedema, & Huaug, 2015; Mansour, 2016; Mansour, Eljelly, & Abdullah, 2016; Marakarkandy, Yajnik & Dasgupta, 2017; Ozlen & Djedovic, 2017; Patel & Patel, 2018). Davis argued that people adopt technology primarily because of the functions it performs and secondly because of the ease or difficulty with the system performing these functions (Mansour, 2016; Mansour et al., 2016; Ozlen & Djedovic, 2017; Patel & Patel, 2018). TAM is concerned with PU, individuals' belief that the use of technology will improve their job performance; and PEOU, individuals' belief that use of such technology would require minimal effort (Mansour et al., 2016; Marakarkandy et al., 2017; Patel & Patel, 2018; Shaikh & Karjaluoto, 2015; Sharma, Govindaluri, & Balushi, 2015).

Theorists of TAM confirmed the model as a powerful and parsimonious concept and sought to provide bank leaders, local governments, marketing professionals, and Internet banking service providers with strategies to enhance their e-banking platforms, features, and benefits to increase the rate of customers' adoptions (see Aboobucker & Bao, 2018; Mansour et al., 2016; Marakarkandy et al., 2017; Patel & Patel, 2018; Shaikh & Karjaluoto, 2015; Sharma et al., 2015). As it related to this quantitative correlational study, I applied TAM as the theoretical framework because it aligned with my objective to examine the factors that influence customer adoption of e-banking services in Barbados.

Operational Definitions

Branch-based banking: Branch-based banking refers to financial activities that customers perform over the counter (OTC) in the retail banking industry (Gaservic, Vranjes & Drinic, 2016).

Competitive advantage: Competitive advantage is a firm's differential position through access to resources, markets, and opportunities for its products or services (Arbi, Bukhari, & Saadat, 2017)

Electronic banking: Electronic banking is a technology-enabled self-service channel for customers in the banking industry to perform financial transactions via the Internet, mobile, telephone, or automated teller machines (ATMs; Rad et al., 2017).

Innovation technology: Innovation technology refers to the process of generation, acceptance, and implementation of new technological changes to improve services, systems, or processes (Perez, Popadiuk, & Cesar, 2017).

Perceived ease-of-use (PEOU): Perceived ease-of-use is the extent to which a consumer believes that using electronic banking is effortless (Davis, 1989).

Perceived usefulness (PU): Perceived usefulness represents the degree to which a consumer believes that using the technology will increase performance (Davis, 1989)

Transaction cost: Transaction cost refers to the operational expenses associated with retail banks performing customer financial OTC activities (Akhisar et al., 2015).

Assumptions, Limitations, and Delimitations

In the following subsection, I discussed the assumptions, limitations, and delimitations of this study. Assumptions are beliefs that are true but unverifiable (Bryman, 2016; Leedy & Ormrod, 2015; Marshall & Rossman, 2014). Limitations are factors that the researcher has no control over but could negatively influence the study (Leedy & Ormrod, 2015; Marshall & Rossman, 2014; Yin, 2018). Delimitations are the elements the researcher outlined as the scope of the research (Ensslin, Dutra, Ensslin, Chaves, & Dezem, 2015; Leedy & Ormrod, 2015; Marshall & Rossman, 2014).

Assumptions

Assumptions are the researcher's underlying and inherent beliefs that are true but unverifiable and usually direct the research study (Leedy & Ormrod, 2015; Marshall & Rossman, 2014; Yin, 2018). Assumptions are also the factors that a researcher may not have control over but form part of the study (Cerniglia, Fabozzi, & Kolm, 2016; Leedy & Ormrod, 2015). In this quantitative correlation study, I had the following assumptions: (a) the participants voluntarily participated in the survey; (b) each participant responded to the survey questions honestly, independently, and anonymously; (c) the participants'

responses to the survey questionnaire were accurate representations of the opinions of all electronic banking customers in Barbados; (d) the participants were knowledgeable in electronic banking services, and (e) the opinions of the selected participants represented the views of other electronic banking customers in the retail banking industry in Barbados.

Limitations

Limitations are factors that could negatively impact the quality of the study (Adewunmi, Koleoso, & Omirin, 2016; Friedman, Fireworker, & Nagel, 2017; Leedy & Ormrod, 2015). In correlational studies, the researcher investigates the interactions of variables but cannot prove cause and effect (Altman & Krzywinski, 2015; Leedy & Ormrod, 2015). There were four limitations in this study. The first limitation was that participants could withdraw from the survey at any time; therefore, the valid responses may not be a representation of the population. The second limitation was the use of the survey technique with closed-ended responses of participants. Thirdly, the study focused on retail banking customers in Barbados that might not have represented the views of electronic banking customers in other customer groups, financial institutions, or countries within the Caribbean region. Lastly, this study might become irrelevant due to technology advances in electronic banking in response to environmental factors or increased customer demands.

Delimitations

Delimitations refer to the restrictions the researcher introduced in the study as well as the scope and boundaries that governed the research (Ensslin et al., 2015; Jolley

& Mitchell, 2010; Leedy & Ormrod, 2015). Delimitations of my study included the following: (a) I did not address customer reaction to electronic banking services; (b) I collected data from customers who met specific criteria; (c) the study did not include other factors such as new products, changes to existing technologies, regulations, or environmental changes that could influence the conversion of customers to electronic banking services, and (d) the findings of this study might be only applicable to Barbados. This decision may have limited my ability to investigate more themes to support my research or identify additional issues impacting retail banking leaders' abilities to increase customer adoption of electronic banking by focusing on one geographic area.

Significance of the Study

Over the past 2 decades, there has been a rapid growth in technology innovation in the banking industry. Retail banking leaders continue to invest in Internet banking, mobile banking, point-of-sale, and automated teller machines to offer customers convenient ways to conduct their financial activities while reducing operating expenses associated with branch-based transactions (Akhisar et al., 2015; Alkailani, 2016; Shaikh & Karjaluoto, 2015). However, the success rate of converting customers to electronic banking has been slower than bank leaders expected (Akhisar et al., 2015; Alkailani, 2016; Olufemi & Ezekiel, 2017; Shaikh & Karjaluoto, 2015). The significance of this study was three-fold: (a) to help retail banking leaders, marketers, and technology developers improve the design and implementation strategies for their electronic banking services to increase customers' adoption; (b) to enhance the existing customers'

experiences with electronic banking services; and (c) to provide information to attract non-users to adopt electronic banking services.

Contribution to Business Practice

This study was significant to business practice because I provided information to potentially help retail banking leaders understand customers' expectations of electronic banking services and develop strategies to address customers' concerns in Barbados. I also provided a model that might help retail banking leaders reduce high-cost branch-based transactions with the adoption of lower-cost electronic banking services that could increase profitability and sustain competitive advantage.

Implications for Social Change

The implications for social change included the potential to provide an improved understanding of electronic banking services to Barbadian residents, to increase awareness of the availability of electronic banking services to retail banking customers in Barbados, and to create access to affordable financial services for individuals in Barbados. Increased usage of electronic banking services could stimulate the progression of Barbados into an environmentally friendly society with a reduction in the paper used to perform branch-based transactions.

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A Review of the Professional and Academic Literature

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A literature review is a synthesis of published literature on known and unknown information about a research topic (Saunders et al., 2015). A literature review is either narrative, which critiques a topic but does not provide information on the selection criteria for the studies, or systematic, where studies are selected based on the research

topic (Onwuegbuzie & Weinbaum, 2017). I began the literature review with a systematic review of the extant literature on TAM, the predictor variables (PU and PEOU) of the study, and prior research on TAM and e-banking adoption. The section contained a detailed discussion on the rival theories and measurement. I discussed other factors that could affect customer adoption of e-banking, provided an overview of the dependent variable (e-banking adoption), examined innovation technology and transformational leadership, and innovation technology and strategic planning. I concluded with an explanation of innovation technology and banks' profitability performance and other diversification strategies to increase banks' profitability. The literature review contained 218 peer-reviewed references, with 201 (92.20%) published within the past 5 years as of 2019.

I explored the Walden University online library as the primary source for articles relevant to my research problem. I also accessed other electronic databases including, EBSCOHost's Business Complete, Proquest's ABI/INFORM Complete, Proquest Central, Emerald Management Journals, SAGE Journals, and Google Scholar. My search was limited mainly to peer-reviewed articles within 5 years as of 2019. I used search terms such as *technology acceptance model, TAM, technology adoption, electronic banking, e-banking, mobile banking, Internet banking, online banking, electronic banking in Barbados,* and *innovation technology*.

Application to the Business Problem

The purpose of this quantitative correlational study was to examine the relationship between PU, PEOU and customer adoption of e-banking services in

Barbados. The null hypothesis was that there is no statistically significant relationship between PU, PEOU, and customers' adoption of e-banking services. The alternative hypothesis was that there is a statistically significant relationship between PU, PEOU, and customers' adoption of e-banking services. The targeted population was comprised of adult individuals residing on the island of Barbados. The implications of this study for positive social change included the potential to provide an improved understanding of electronic banking services to Barbadian residents, to increase awareness of the availability of electronic banking services to retail banking customers in Barbados, and to create access to affordable financial services for individuals in Barbados. Increased usage of electronic banking services could stimulate the progression of Barbados into an environmentally friendly society with a reduction in the paper used to perform branch-based transactions.

The Technology Acceptance Model

Researchers use the TAM model to examine the impact of technology on human behavior (Chauhan, 2015; Sinha & Mukherjee, 2016). Davis (1986) developed the TAM model to analyze the impact of external factors on internal beliefs, attitudes, and intentions (Chauhan, 2015; Illia et al., 2015; Mansour, 2016; Priya et al., 2018). The TAM is rooted in cognitive psychology and is an extension of Fishbein and Ajzen's (1975) TRA. Fishbein and Ajzen claimed that users' attitudes influenced their behavioral intentions and subjective norms in accepting information technology (Mansour et al., 2016; Marakarkandy et al., 2017; Ozlen & Djedovic, 2017; Patel & Patel, 2018; Sinha & Mukherjee, 2016). Davis hypothesized that people accept technology because of the

functions it performs (PU) and the ease or difficulty of the system performing these functions (PEOU; Mansour, 2016; Mansour et al., 2016; Ozlen & Djedovic, 2017; Patel & Patel, 2018).

TAM is concerned with two constructs: PU, referred as the extent to which individuals believe that the use of technology will improve their job performance, and PEOU, known as the degree to which individuals believe that use of such technology would require minimal effort (Mansour et al., 2016; Marakarkandy et al., 2017; Patel & Patel, 2018; Shaikh & Karjaluoto, 2015; Sharma et al., 2015). Theorists of TAM viewed the model as a powerful and parsimonious concept and sought to provide bank leaders, local governments, marketing professionals, and Internet banking service providers with strategies to enhance their e-banking platforms, features, and benefits to increase the rate of customers' adoptions (see Aboobucker & Bao, 2018; Alalwan, Dwivedi, Rana & Williams, 2016; Mansour et al., 2016; Marakarkandy et al., 2017; Patel & Patel, 2018; Shaikh & Karjaluoto, 2015; Sharma et al., 2015).

Perceived usefulness (PU). Within the TAM framework, PU is associated with productivity and performance (Priya et al., 2018; Ramos, Ferreira, de Freitas, & Rodrigues, 2018). Users perceive systems to be useful when they use the technology to improve their job performance and productivity (Davis, 1989; Patel & Patel, 2018; Priya et al., 2018). PU plays an important role in strategic decision making as it relates to the development of the features and functionalities of a system. Priya et al. (2018) purported that users perceive a system to be useful when they think a positive relationship between its usefulness and performance. Fellow researchers claimed that PU is a significant factor

that affects user acceptance of information technology (see Alkailani, 2017; Mansour et al., 2016; Marakarkandy et al., 2017; Rodrigues, Oliveira, & Costa, 2016). In the context of e-banking, if customers believe that online and mobile banking services are useful, they will accept them as alternative options to traditional banking.

According to Marakarkandy et al. (2017), the most useful feature of online banking is its 24-hour availability, Alkailani, (2016) supported this claim and highlighted that the ease of processing transactions and increased financial transparency were additional benefits of online banking usefulness. Priya et al. (2018) found that customers perceived mobile banking useful because it was low cost, convenient, and easy to conduct banking. For the purpose of this study, I adopted Liebana-Cabanillas, Munoz-Leiva, Sanchez-Fernandez, and Viedma-del Jesus's (2016) and Rodrigues et al.'s (2016) definitions of PU as the degree to which a bank's customer perceives that the use of a business application makes it easier to purchase or sell financial products. Bank leaders could benefit from increased financial performance with reduced overhead expenditures associated with facilitating branch-based banking.

Perceived ease of use (PEOU). The theorists of the TAM framework posited that PEOU is a significant determinant of user acceptance by influencing the attitudes of users to adopt new technologies (Patel & Patel, 2018; Priya et al., 2018; Ramos et al., 2017). Researchers claimed that the concept of PEOU is an important factor in the acceptance of information technology and is significant when demonstrated through PU of the systems (Alkailani, 2016; Liebana-Cabanillas et al., 2016; Mansour et al., 2016; Rodrigues et al., 2016). According to Davis (1989), PEOU may be an antecedent of PU rather a direct

determinant of technology usage. In the context of e-banking, PEOU means hassle-free use of online and mobile banking services while finding the experience to be enjoyable (Alkailani, 2016; Liebana-Cabanillas et al., 2016; Ramos et al., 2017; Rodrigues et al., 2016; Sinha & Mukherjee, 2016). Mansour et al. (2016) and Rodrigues et al. (2016) stated that if users perceived e-banking easy to use, they would be more likely to adopt the services. Priya et al. (2018) supported this claim and noted that when customers perceive mobile services to be easy, they feel less threatened using the applications.

In previous studies on TAM, researchers found that PEOU had a direct positive impact on the adoption of e-banking or predicted customer adoption of e-banking (Patel & Patel, 2018). Other researchers did not identify a significant relationship between PEOU and technology adoption (Marakarkandy et al., 2017; Patel & Patel, 2018). To increase the use of mobile banking, researchers recommended that bank leaders and developers should design the applications with user-friendly interfaces, graphical layouts, and intuitive navigation to address potential user deterrents with using small screens to perform banking activities (Priya et al., 2018; Ramos et al., 2017). In this study, I examined the effect of PEOU on the adoption of e-banking services in Barbados.

TAM literature on e-banking adoption. There is a plethora of research on TAM and e-banking adoption. Researchers who use TAM as the theoretical framework attempted to examine PU and PEOU as factors that affect customer intention to adopt e-banking services (Bambore & Singla, 2017; Mortensona & Vidgen, 2016; Vejacka & Stofa, 2017). Magotra (2016) conducted a study on mobile banking adoption in India. The results from data collected on 413 respondents showed that PU and PEOU were

significant factors affecting the adoption of mobile banking. Similarly, Rahi, Ghani, and Alnaser (2017) designed an empirical study using TAM as the theoretical framework to explore the factors affecting Internet banking adoption in Pakistan. Rahi et al. analyzed data from 265 respondents and found that PU and PEOU were important to increasing the customer adoption rate. In subsequent studies, researchers used the TAM framework to examine the significance of PU and PEOU on customer adoption of e-banking and supported previous findings.

George (2018) examined the effects of PU and PEOU on the perceptions of users to adopt Internet banking in Kerala, India. George used the random and convenience sampling methods and collected data from 406 respondents. The results showed that PU and PEOU had a direct effect on the use of Internet banking. Chandio et al. (2017) investigated the constructs of the TAM framework to understand and predict user behavioral intention to use online banking in Pakistan. Chandio et al. collected 310 responses, and the analysis showed that the impact of PU on intended behavior was more significant than the effect of PEOU, but individual behavior intention to adopt online banking was dependent on both PU and PEOU. I will, therefore, adopt the TAM framework to examine the significance of PU and PEOU on customer adoption of e-banking in Barbados.

Limitations of the TAM. Teo et al. (2015) found that several researchers commented on the limitations of TAM. The theorists stated that the TAM framework did not include economic, demographic, or external variables that might affect customer intention to adopt technology (Venkatesh & Davis, 2000). Ajibadi (2018) argued that

TAM is concerned with personal use but did not address acceptance of technology in the context of business, educational institutions, or organizations. Ozlen and Djedovic (2017), in their study on online banking acceptance in Bosnia, claimed that TAM lacked incorporating social structure and acceptance. Other researchers claimed that the TAM alone did not have adequate explanatory power to predict customers' intentions to adopt e-banking (Teo et al., 2015). Chechen, Yi-Jen, and Tung-Heng (2016), Rfieda and Mira (2018), and Sinha and Mukherjee (2016) found that a combined model using TAM and diffusion of innovation (DOI) had a better explanatory power instead of the TAM constructs. The TAM is cross-sectional, which researchers highlighted as a limitation in their studies on e-banking adoption (Chandio et al., 2017; George, 2018; Patel & Patel, 2018; Priya et al., 2018; Yaseen & El Qirem, 2018). Similarly, researchers cited the generalization and validity of the findings in their studies using the TAM framework as a limitation of their research (Aboobucker & Bao, 2018; Chandio et al., 2017; Priya et al., 2018; Ramos et al., 2018; Yaseen & El-Qirem, 2018). Researchers therefore sought to address the limitations of the TAM.

In prior studies on e-banking adoption, researchers cited several limitations of the TAM framework to predict customer intention to adopt e-banking services and included other external variables to strengthen the model (Chauhan, 2015; George, 2018; Kaushik & Rahman, 2015; Novita, 2017; Rawashdeh, 2015; Shaikh & Karjaluoto, 2015; Cristovao-Verissimo, 2016; Yaseen & El Qirem, 2018). The variables most frequently examined included perceived risk, security, and trust (Alkailani, 2016; Mansour, 2016; Liebana-Cabanillas et al., 2017; Sinha & Mukherjee, 2016). Sharma et al. (2015)

extended the TAM model to include service quality and trust in their study to explore the determinants of Internet banking adoption. The authors collected data from 110 Internet banking users to analyze and concluded that PU, PEOU, service quality, and trust were significant determinants of Internet banking adoption (Sharma et al., 2015). Normalini (2019) extended TAM to include quality dimensions and attitude as independent variables to understand the impact of quality on customer intention to continue using Internet banking in Malaysia. The results from 413 respondents showed that PU, PEOU, quality dimensions, and attitude were significant determinants of intention to continue using Internet banking. Danurdoro and Wulandari (2016) surveyed 96 students to explore the effects of PU, PEOU, subjective norm, and experience on students' intention to adopt Internet banking in Indonesia. The results showed that PEOU and experience significantly affected students' intention to adopt Internet banking. Conversely, the impact of PU and subjective norm was insignificant. Ozlen and Djedovic (2017) extended TAM to include perceived system security and perceived system quality. Despite researchers' efforts to modify the TAM to strengthen their findings, limitations remained evident.

To address the limitations of TAM, researchers recommended future studies include moderating factors such as gender, age, and income (Cocosila & Trabelsi, 2016; Danyali, 2018; Liebana-Cabanilla et al., 2016; Ramos et al., 2018). Some researchers recommended a longitudinal design approach to better understand the causality of variables (Aboobucker & Bao, 2018; Chandio et al., 2017; George, 2018; Patel & Patel, 2018; Priya et al., 2018; Yaseen & El Qirem, 2018). Future research should include a

wider population to improve the generalizations of results (George & Kumar, 2015; Sharma et al., 2015; Tseng, 2015) and additional independent constructs (Aboobucker & Bao, 2018; Choudrie, Junior, McKenna, & Richter, 2018; George, 2018; Illia et al., 2015; Mansour, 2016; Marakarkandy et al., 2017). Despite the above limitations, several researchers validated the TAM framework as a suitable model for investigating technology acceptance. Therefore, I used the TAM framework to examine the significance of PU and PEOU on customer adoption of e-banking services in Barbados.

Rival Theories

Researchers used other theories to examine the factors that influence customer adoption of e-banking. Maduku (2017) noted that prominent alternate theoretical frameworks included the theory of planned behavior (TPB; Ajzen, 1985), diffusion of innovation (DOI; Roger, 1995), extended TAM (TAM2; Davis et al., 1992), unified theory of acceptance and use of technology (UTAUT; Venkatesh, Morris, Davis, & Davis, 2003), and extended unified theory of acceptance and use of technology (UTAUT2; Venkatesh, Thong, & Xu, 2012). Critics of TAM also challenged theorists to develop frameworks comprised of additional constructs to increase the strength of the correlation and predictability between predictor variables and user adoption of technology (Ajibadi, 2018; Ozlen & Djedovic, 2017; Teo et al., 2015). Alternate theories, therefore, play an important role in helping researchers determine the factors that affect customer adoption of e-banking.

Theory of planned behavior (TPB). Ajzen (1985) developed the TPB as an improvement to the TRA previously proposed in 1975 by Fishbein and Ajzen that

explained human behavior. Ajzen argued that behavioral intention is the antecedent of behavioral adoption (Gourlan, Bord, & Cousson-Gelie, 2019). Ajzen posited that three constructs influence behavioral intention, namely, attitude towards the behavior (ATT), subjective norm regarding the behavior (SN), and perceived control over the behavior (PBC; Asadi, Hussin, & Saedi, 2016; Umer, Qazil, & Makhdoom, 2018). ATT could be favorable or unfavorable feelings towards adoption, SN responding to social pressures from others to adopt, and PBC highlights an individual's ability to adopt (Chiu, Bool, & Chiu, 2017; Gourlan et al., 2019; Yu, 2015). These assumptions were tested by researchers to validate the theorists' arguments.

Researchers use the TPB to predict human behavior in the fields of information technology and environmental issues (Kamrath, Rajendran, Nenguwo, Afari-Sefa, & Broring, 2018; Koul & Eydgahi, 2017), healthcare (Gourlan et al., 2019; Sussman & Gifford, 2019), and entrepreneurial discipline (Anjum, Sharifi, Nazar, & Farrukh, 2018; Gonzales, Jaen, Topa, & Moriano, 2019). Other researchers, however, cited limitations with the TPB model that included the assumed linear relationship between the constructs and the direct impact of intentions on physical activity (Gourlan et al., 2019). Yadav, Chauhan, and Pathak, (2015) examined customer behavioral intentions to adopt Internet banking and found a combination of the TPB and TAM models was a suitable approach. In this study, I did not intend to examine behavioral intention; therefore, TPB was not appropriate.

Diffusion of innovation theory (DIT or DOI). Roger (1995) developed the DOI also called the epidemic model of adoption to explain how users adopt or reject

innovations for products and services through social influence or social contagion (Chiyangwa & Alexander, 2016; Yapp, Balakrishna, Yeap, & Ganesan, 2018). DOI has five characteristics that influence the adoption of innovation: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability (Chiyangwa & Alexander, 2016; Yapp et al., 2018). The general assumption of DOI is that the innovations are superior to, and replace, previous systems or models (Mullan, Bradley, & Loane, 2017), and researchers tend to use either the preadoption or postadoption process to validate their assumptions regarding user adoption of technology (Estrella-Ramon, Sanchez-Perez & & Swinnen, 2015; Montazemi & Qahri-Saremi; 2015). Researchers found that DOI applied to groups instead of individuals, with specific focus on timelines (Chiyangwa & Alexander, 2016). I examined factors that influence individuals' adoption of technology, therefore, the DOI model was not suitable for this study.

Extended TAM (TAM2). Davis et al. (1992) developed the TAM2 to explain the causal relationship between users' internal beliefs: PU, PEOU, and perceived enjoyment (PE), attitude, intentions, and usage behavior. TAM2 supplemented the limitation with the TAM explanatory power regarding intrinsic motivators, such as trust, security, PE, social influences, brand equity, and past use experience, and user acceptance of hedonic-oriented information systems (Cheng, 2015; Chi, 2018; Li, Chung, & Fiore, 2017; Wang & Goh, 2017). Davis et al. argued that PE and PU mediated the influence of PEOU, and the three variables are relevant for users to adopt computer-based technology. Cheng (2015) supported Davis et al.'s claim and found that both extrinsic factors (PU and PEOU) and the intrinsic motivator (PE) influenced user intention to adopt m-learning.

Researchers used the TAM2 model to examine causal relationships between user acceptance of technology in the fields of e-commerce and m-commerce (Chi, 2018; Li et al., 2017; Yadav & Mahara, 2019), e-learning (Akman & Turhan, 2017; Chang, Hajiyev, & Su, 2017; Cheng, 2015; To & Tang, 2019), healthcare (Ducey & Coovert, 2016), gaming (Wang & Goh, 2017; Wang & Sun, 2016), and e-banking (Alkailani, 2016; Goran & Jovana, 2017; Mansour, 2016; Patel & Patel, 2018) among various demographical groups. Haider, Changchun, Akram, and Hussain (2016) adopted the TAM2 in their study on e-banking because it was extensively used in recent studies and therefore appropriate for their research on customer intention to adopt mobile banking. I did not examine the relationship between intrinsic motivators as factors that influence customer adoption of e-banking services in Barbados; therefore, the TAM2 theory was not appropriate for this study.

Unified theory of acceptance and use of technology (UTAUT). Venkatesh et al., (2003) developed the UTAUT model to increase the predictive power for behavioral intention (BI) toward adoption of technology (Teo et al., 2015; Wang, Cho, & Denton, 2017). The UTAUT model is a combination of eight established information systems theories, namely, TRA, TAM, IDT, TPB, motivational theory (MM), a combination of the TAM and TPB models, a model of PC utilization (MPCU), and social cognition theory (SCT) (Tan & Lau, 2016; Teo et al., 2015; Maduku, 2017). The UTAUT model has four core constructs: (a) performance expectancy (PE), (b) effort expectancy (EE), (c) social influence (SI) to determine customer behavioral intention, and (d) facilitating condition (FC) to determine use behavior (Lee, Lin, Ma, & Wu, 2017; Tan & Lau, 2016;

Teo et al., 2015; Venkatesh et al., 2003). The model also incorporates four moderating variables: gender, age, experience, and voluntariness of use (Tan & Lau, 2016). Venkatesh et al. claimed that the UTAUT model has the highest explanatory power and capability of explaining 70% of the variance in BI to adopt and 50% in of the variance in technology use (Maduku, 2016; Yaseen & El Qirem, 2018). Therefore, the UTAUT model appeared to be a suitable framework to examine technology acceptance.

Researchers adopted the UTAUT model in various technology acceptance studies in e-banking (Bhativasevi, 2016; Savic & Pesterac, 2018), e-commerce (Blaise, Halloran, & Munch-Nick, 2018; Sanchez-Torres et al., 2017), and e-health (Kurila, Lazuras, & Ketikidis, 2016). While the UTAUT model has been extensively used in current studies, researchers modified the model to include other variables such as computer anxiety (Cimperman, Brencic, & Trkman, 2016; Nysveen & Pedersen, 2016) and trust (Warsame & Ireri, 2018) to increase the predictability of customer behavioral intention to adoption technology. Other researchers added security, risk, and task-technology fit (Tarhini, El-Masri, Ali, & Seranno, 2015), or perceived credibility, cost, and convenience (Bhatiasevi, 2016) to determine the degree of influence other variables had on customer adoption of technology. In recent studies, researchers combined UTAUT with the TAM model to better explain user intentions to adopt new technology (Ali & Arshad, 2016). Kuila et al. recommended the UTAUT model because they found that PE and EE within the model were similar to PU and PEOU in the TAM model, therefore, I did not use the UTAUT model in this study.

Extended unified theory of acceptance and use of technology (UTAUT2).

Venkatesh et al. (2012) created the UTAUT2 model to study technology acceptance and use in a customer context. The UTAUT2 model has three additional new constructs: (a) habit, (b) hedonic motivation, and (c) price value to determine customer usage of technology to the existing four variables in the UTAUT model (Farah, Hasni & Abbas, 2018; Yaseen & Al Qirem, 2018). The UTAUT2 model also incorporates individual, technological, and environmental components to understand what drives individual intention to adopt systems (Farah et al., 2018). The theorists claimed that the UTAUT2 model enhanced the variance explained in technology use from 40% to 52% in the UTAUT model to 56% to 74% for behavioral intention (Gharaibeh & Arshad, 2018; Yaseen & Al- Qirem, 2018). Thus, the UTAUT2 model was appropriate for examining several variables affecting behavioral intention to accept technology.

Researchers adopted the UTAUT2 model in various technology acceptance studies in e-banking (Alalwan et al., 2018; Baabdullah, Alalwan, Rana, Kizgin, & Dwivedi, 2019; Farah et al., 2018), m-commerce (Blake, Neuendorf, LaRosac, Luming, Hudzinski, & Hu, 2017; Shaw & Sergueeva, 2019), and mobile learning (El-Masri & Tarhini, 2017). According to Farrah et al. (2018), the UTAUT2 model could strengthen the predictive power of customer technology adoption if it included trust and perceived risk. There are mixed researchers' views on the application of the UTAUT2 model to research in the adoption of e-banking. Yaseen and Al Qirem (2018) claimed that there was limited use of the UTAUT2 model in e-banking adoption studies, while Sanchez-Torres et al. (2017) noted that the UTAUT2 model was extensively used in e-banking

adoption. According to Tak and Pankar (2016), there is limited research on the use of the UTAUT2 model in studies on adoption of health apps, mobile payments, and mobile learning. For this study, I did not use the UTAUT2 model as the theoretical framework because I did not intend to examine customer behavioral intentions to adopt e-banking services in Barbados.

Measurement

The adoption of a suitable measurement tool will impact the outcome of a study. When researchers choose to develop surveys using references from the extant literature, it signifies ownership of the survey design, but the process could be time-consuming, and the instruments must be tested using a pilot study to ensure that the reliability and validity of the instrument are not compromised (Clements & Boyle, 2018; Shaw & Sergueeva, 2019). Ramos et al. (2018) found that survey instruments are the most popular measurement tool for data collection in quantitative studies. In prior research on customer adoption of technology, researchers used web-based surveys (Olasina, 2015; Sharma et al., 2015) and paper-based surveys (Al-Jabari, 2015; Farah et al., 2018; Maduku, 2017; Tan & Lau, 2016) as the primary data collection instruments. Several researchers used the TAM survey in their studies (Malaquias & Hwang, 2019; Mansour, 2016; Patel & Patel, 2018; Priya et al., 2018) while others used previous researchers' questionnaires to customize their surveys (Alkailani, 2016; Kampakaki & Spyros, 2016; Teo et al., 2015; Tseng, 2015).

TAM survey. Davis (1989) developed the TAM survey instrument to support his TAM theory. Davis designed the TAM survey to test the significance of the constructs:

PU and PEOU, on customer adoption of technology. Davis claimed that the TAM survey adequately captured the reasons why customers adopted new technology. The survey consists of two scales with six questions each for both constructs, for a total of 12 questions. One scale consists of a score relative to the impact of the PU inclusive of (a) speed of systems, (b) systems' performance, (c) productivity, (d) effectiveness of systems, (e) ease of doing tasks, and (f) useful of systems. The other scale consists of the attributes for PEOU: (a) meets needs of user, (b) easy to understand, (c) flexible, (d) improves user skills, and (e) easy to use (Davis, 1989; Malaquias & Hwang, 2019; Priya et al., 2018). The questions aligned to the TAM theory appear on an ordinal scale, with a 7-point Likert scale with responses ranging from *extremely likely to extremely unlikely*. In a cross-section of studies on customer adoption of technology in e-commerce, education, transportation, and cloud computing, researchers used the questions on PU and PEOU in the TAM survey (Bollinger, Mills, White, & Kohyama, 2015) or extended the TAM survey to include questions for additional variables (Mansour, 2016; Patel & Patel, 2018). The TAM survey also formed the basis for several research studies on customer adoption of electronic banking in developed and developing countries (Akhisar, Tunay, & Tunay, 2015; Sanchez-Torres et al., 2018). The TAM survey was, therefore, relevant for this study.

The reliability of the TAM survey instrument has a Cronbach's alpha value of .843 (Olufemi & Ezekiel; 2013). Priya et al. (2018) used the TAM survey to examine the factors that affected mobile banking adoption among 269 young Indian consumers. The scale had composite reliability >0.7, which met the recommended minimum requirement

of .70 (Heale & Twycross; 2015). Malaquias and Hwang (2019) used the TAM survey to conduct a comparative study on the determinants of customer adoption of e-banking in Brazil and the United States. The authors found the scale to have internal reliability with a lower bound of 0.075 and upper bound of 0.092. While most researchers used the TAM survey in their studies on customer adoption of technology, others used a combination of questionnaires from the extant literature to design their surveys (Abbasi, Kamran, & Akhtar, 2017; Alkailani, 2016; Teo et al., 2015; Tseng, 2015).

Customized online surveys. Researchers who used the TAM theory as their foundational framework designed surveys from the extant literature instead of using the TAM instrument to determine the factors that influenced customer adoption of technology (Abbasi et al., 2017; Dakduk, Ter, Santala, Molina, & Malave, 2016; Lee, Yang & Johnson, 2017; Mokhtar, Katan, & Hidayat-ur-Rehman, 2018; Wang, Wang & Wu, 2015). Conversely, other researchers who chose various theoretical frameworks to adopt questions to design their surveys, for example, Asadi, Nilashi, Husin, and Yadegaridehkordi (2017) designed a survey with 33 questions extracted from eight studies, and Roy (2017) adopted questions from four previous studies on customer adoption of technology to develop a survey to examine customer adoption of app-based cab services. Likewise, Sarmah, Rahman, and Kamboj (2017) developed their survey from a selection of nine studies.

In prior studies on customer adoption of e-banking services, researchers opted to design surveys using questions from the extant literature (Alkailani, 2016; Malaquias & Hwang, 2019; Olufemi & Ezekiel, 2017; Pamungkas & Kusuma, 2017). Asadi et al.

(2017) found that using self-developed surveys influenced by questions adapted from previous research strengthened the validity of their study. Researchers also used paper-based surveys to examine customer adoption of technology.

Paper-based survey. Researchers used paper-based surveys for data collections instead of online surveys because of restrictions, security risks, or preference (Al-Jabari, 2015; Bollinger et al., 2015). In prior research on customer adoption of technology, researchers designed paper-based surveys from the extant literature and adopted similar methodologies used for online surveys to measure the reliability and validity of the paper-based survey instruments (Al-Jabari, 2015; Braekman et al., 2018). Researchers also used the analysis of data collected from paper-based surveys to discuss the findings of their studies (Al-Jabari, 2015).

Researchers claimed that a benefit from distribution of paper-based surveys is that they are available to respond to participants' queries unlike the impersonal nature of online surveys (Agarwal, Paswan, Fulpagare, Sinha, Thamarangsi, & Rani, 2018; Al-Jabari, 2015; Farah et al., 2018; Maduku, 2017; Tan & Lau, 2016). Al-Jabari (2015) conducted a study to understand the factors that influence customer intention to adopt mobile banking in Saudi Arabia. The author used a paper-based survey to collect data from 253 participants. The findings showed that compatibility had a significant influence on customer intention to adopt mobile banking, while perceived risk was a deterrent. Paper-based surveys, however, require manual data entry of participants' responses into a statistical software for data analysis, whereas online surveys could be exported electronically for data analysis (Agarwal et al., 2018: Braekman et al., 2018). Therefore,

in this study, I used a web-based survey to collect data using the TAM instrument to examine the impact of the two constructs (PU and PEOU) on customer adoption of e-banking in Barbados.

Other Factors Affecting E-Banking Adoption

Several variables affect customer adoption of e-banking adoption. In this study, I examined the relationship between PU and PEOU on customer adoption of e-banking in Barbados. From my review of the extant literature researchers modified the TAM model to include other variables from various theoretical frameworks, such as DOI, UTAUT, TAM2, and UTAUT2, to determine their significance on e-banking adoption (Joachim, Spieth, & Heidenreich, 2018; Laukkanen, 2016; Oruc & Tatar, 2017; Sharma, Mangla, Luthra, Al-Salti, 2018). The most extensively researched variables were trust, risk or perceived risk, social influence, and self-efficacy. I discussed the above variables and their possible influence on e-banking adoption.

Trust. While trust is not an independent variable of this study, it has been widely researched as a factor that could negatively impacts customer adoption of e-banking and e-commerce (Asni, Nasir, Yunus, & Nurdasila, 2018; Kaabachi, Mrad, & O'Leary, 2018; McNeish, 2015; Szopinksi, 2016). Trust is a complex, multidisciplinary concept applied to building relationships between institutions and individuals in the fields of psychology, health, sports, finance, and e-commerce (Malaquais & Hwang, 2016; Wang, Ngamsiriudom, & Hsieh, 2015). Pamungkas and Kusuma (2017) claimed that researchers are yet to agree a definition for trust due to its complexity. Yu and Asgarkhani (2015) support this claim noting that trust is a multidimensional concept, and defined trust in e-

banking as a customer's willingness to conduct online transactions with the belief that banks will fulfil their obligations, despite having the ability to monitor the banks' actions. Damghanian, Zarei, and Kojuri (2016) noted that customers' trust in banks increase if they believe that banks have the required knowledge, experience, and skills, and consider their interests when performing transactions. Researchers use four constructs: competence, integrity, benevolence, and predictability to assess trust (Skvarciany & Jurevicience, 2018; Yu & Asgarkhani, 2015).

In prior studies on e-banking adoption, researchers modified various theoretical frameworks on technology acceptance to include trust as a variable to determine if it significantly impacted customer behavioral intention to adopt e-banking (Salem, Baidoun & Walsh, 2019; Sharma & Sharma, 2019). Chiu et al. (2017) collected and analyzed data from 314 non-users of mobile banking in the Philippines and found that trust significantly influenced non-user behavioral intention to adopt mobile banking. Malaquais and Hwang (2017) examined the impact of trust as an antecedent to the utilitarian (online banking, online shopping), and hedonic values (entertainment) of mobile devices in Brazil. Malaquais and Hwang collected data from 1,080 respondents trust had a positive relationship utilitarian values for customers who used their mobile devices for online banking and e-commerce. Conversely, the relationship between hedonic values and trust was insignificant. Yu and Asgarkhani (2015) conducted a comparative study on trust in e-banking in Taiwan and New Zealand sampling 510 and 122 respondents respectively, and found that despite cultural differences, customer trust is a significant factor in adoption of

e-banking services. Trust, therefore, may affect customer adoption of e-banking services in Barbados.

Risk or perceived risk. Researchers claimed that risk is a barrier to the adoption of any innovation (Serener, 2019). Risk is defined as an individual's tolerance towards potential losses. The higher the possibility of losses, the more risk an individual perceives (Arora & Kaur, 2018). Risk cannot be measured objectively, therefore theorists focused on individual perceived risk (Akram, Malik, Shareef, & Goraya, 2019). Bauer (1960) developed the perceived risk theory (PRT) to explain the customer risk-increasing or risk-decreasing behavior (Khedmatgozar & Shahnazi, 2018). Perceived risk consists of several dimensions: performance, physical, financial, psychological, privacy, security, and social (Arora & Kaur, 2018; Khedmatgozar & Shahnazi, 2018; Marafon, Basso, Espartel, de Barcello, & Rech, 2017). In the context of e-banking, perceived risk is associated with customer uncertainty or lack of trust in e-banking systems, the higher the uncertainty, the less-likely they will purchase or adopt electronic products or services (Tandon, Kiran, & Sah, 2018; Wei, Wang, Zhu, Xue, & Chen, 2018).

In prior studies on e-banking adoption, researchers purported that perceived risk had a negative influence on customer adoption (Jansen, van Schaik, 2018). Chauhan, Yadav, and Choudhary (2018) conducted a study on the impact of perceived risk on Internet banking adoption in India. Chauhan et al. used data collected from 487 respondents, and found that perceived risk, negatively impacted adoption of Internet banking. Khedmatgozar and Shahnazi (2018) examined the dimensions of perceived risk on 442 corporate clients' intention to adopt Internet banking in Iran, and found that

performance, financial, privacy, security, time, and social risks negatively impacted the clients' intention to adopt Internet banking. While perceived risk is not an independent variable in this study, Marafon et al. (2017) posit that perceived risk is implied in the PU construct of the TAM model, demonstrating confidence in the usefulness of technology. Thus, perceived risk may affect adoption of e-banking in Barbados.

Social influence. While social influence is not an independent variable in this study, the concept has been widely researched as a factor that affects customer adoption of e-banking (Adapaa & Roy, 2017; Chaouali, Yahia, & Souiden, 2016; Matsuo, Minami, & Matsuyama, 2018). Kelman (1958) developed the social influence theory to explain the influence of members in a social network on each other's attitudes or behaviors. Kelman claimed that individual's beliefs, attitudes, and behaviors are influenced by compliance, internalization, and identification (Chaouali et al., 2016). Social influence is also known as social norms or normative pressure and is defined as an individual's perception that important persons believes he or she should use a new technology system (Chaouali et al., 2016; Oliviera, Thomas, Baptista, & Campos, 2016; Ventatesh et al., 2003). Social influence is also the pressure of significant others (family, friends, colleagues) on an individual to adopt a specific behavior or innovation (Farah et al. 2018; Makanyeza, 2017). Social influence is usually associated with TPB and consists of two factors: subjective norm and critical mass.

In prior research on e-banking, researchers examined the impact of social influence as a predictor variable on customer adoption and reported positive correlation between social influence and customer behavioral intention to adopt the new technology

(Kaabachi et al., 2018; Sitorus, Govindaraju, Wiratmadja, & Sudirman, 2018). Matsuo et al. (2018) collected data from 616 respondents in Japan and found that social influence directly and indirectly affected the innovation resistance of experienced and inexperienced users of Internet banking. Mortimer, Neale, Hasan, and Dunphy (2015) modified the TAM model to include social influence as a variable in their comparative study on mobile banking adoption in Thailand and Australia. Mortimer et al. analyzed responses from 348 respondents and concluded that social influence has a significant impact on mobile banking adoption in Thailand and to a lesser extent in Australia. Makanyeza (2017) also identified social influence has a factor that influence mobile banking adoption in Zimbabwe after analysis of data collected from 232 customers in the banking industry. Rahi, Ghani, Alnaser, and Ngah (2018) used the UTAUT model in their study on customer behavioral intentions to adopt Internet banking in Malaysia. Rahn et al. collected data from 398 users and concluded that social influence was a significant influence on Internet banking adoption. Therefore, social influence may affect customer adoption of e-banking services in Barbados.

Self-efficacy. While self-efficacy is not an independent variable in this study, researchers investigated the variable as a factor that affects customer behavioral intentions to adopt of e-banking (Susanto, Chang, & Ha, 2016). Bandura (1986) developed the concept of self-efficacy as part of his social cognitive theory which sought to explain how people learn and interact with others. The key concepts of self-efficacy are efficacy expectations and response outcome expectations. Shao (2018) defined self-efficacy as an individual's belief in his or her capabilities to use technology in diverse

situations. The stronger an individual's self-efficacy, the more persistent to achieve an outcome (Mohammadi, 2015). Orazi and Pizzetti (2015) also highlighted self-efficacy as an individual's coping response to threats.

Marakarkandy et al. (2017) in their empirical study on enabling Internet banking adoption in India, claimed that there is limited research on self-efficacy in TAM, however, other researchers found that self-efficacy affected customer adoption of online banking (Mohammadi, 2015). Singh and Srivastava (2017) examined six factors (computer self-efficacy, PEOU, trust, security, social influence, perceived financial cost) to predict intention to adopt mobile banking in India, and from analysis of the data from 855 respondents, found that computer self-efficacy was the second most important factor to influence customer intention to adopt mobile banking. Likewise, Alalwan et al. (2016) in their study on the influence of PU, trust, self-efficacy on Jordanian customers to adopt telebanking, collected data from 323 respondents and concluded that self-efficacy had a significant influence on customers' behavioral intentions, PU and trust to adopt telebanking. Alalwan et al. (2016) conducted a similar study on customer behavioral intention to adopt mobile banking in Jordan and from analysis of 343 responses, found that self-efficacy as a significant factor in adoption of mobile banking. Davis (1989) claimed that perceived self-efficacy is similar to PU, whereas other researchers suggested to use self-efficacy as an antecedent to PEOU (Mohammadi, 2015). Thus, in this study, the self-efficacy might be a factor that affect e-banking adoption in Barbados.

Electronic Banking Adoption

Senior retail banking leaders implemented technology-based applications, such as Internet banking, mobile banking, point-of-sale terminal (POS), and automated teller machines (ATMs) to meet the customer demands, reduce high branch-based transactions, and sustain competitive advantage (Akhisar et al., 2015; Belas et al., 2016; Dyer, Godfrey, Jensen, & Bryce, 2016; Mishra & Singh, 2015; Rad et al., 2017; Sanchez-Torres et al., 2018). Akhisar et al. (2015), Sanchez-Torres et al. (2018) and van der Boor, Oliveira, and Veloso (2014) agreed that technology innovation helped banking executives to successfully introduce low-cost electronic banking in developed countries. However, Akhisar et al. (2015) and van der Boor et al. (2014) concluded that there was a limited success in developing countries because of an inadequate technology infrastructure or ineffective leadership strategies to transition customers to electronic banking therefore having a negative impact of technology innovation on the banks' profitability.

Online banking. Online banking is a web-based application developed by banks and other financial institutions to offer customers fast and easy access to financial services and transactions (Chandio et al., 2017; Mujinga, Eloff, & Kroeze, 2018; Sharma & Lenka, 2015). Kiljan, Simoens, de Cock, van Eekelen, and Vranken, (2016) noted that online banking became accessible in the late 1990s and grew exponentially from desktop computers to mobile devices. Bank leaders also view online banking as a cost-effective alternative to traditional in-branch services (Chandio et al., 2017).

Researchers found that security is one of the primary customers' concerns with online banking due to threats of cybercrimes (Alghazo, Kazmi, & Latif, 2017; Ali, 2019).

Bank leaders, therefore, continue to invest millions annually to improve their online banking infrastructure to increase customer adoption and address concerns about password integrity, data encryption, privacy, and security (Kilgan et al., 2016; Malik & Oberoi, 2017). Alghazo et al. (2017) also encouraged bank leaders to help users protect themselves again cyber threats by implementing mandatory password changes, complex password constructs, and frequent updates to their browsers. In this study on e-banking adoption, I intended to examine online banking as one of the key components.

Mobile banking. Mobile banking provides an innovated way for customers to conduct banking transactions (funds transfers, enquiring services, instant payments, and bill payments) using a mobile device (Gupta, 2018; Jamshidi, Keshavarz, Kazemi, & Mohammadian, 2018; Tam & Oliveira, 2017) especially the unbanked (Mustafa, 2015) or those who are constrained by distance and transportation issues (Amran, Mohamed, & Yusuf, 2018; Yadav, 2016). Gupta found that the decreasing costs of mobile handsets in India might further increase the mobile penetration rate beyond 90%, while Trialah et al. (2018) noted that mobile banking users in Indonesia reached 80% which was above global average.

Some researchers claimed that despite the high penetration of mobile phones, customer adoption of mobile banking is low (Kansal & Changanti, 2018). Masrek, Mohamed, Daud, and Omar (2014) found that trust was the primary issue affecting customer adoption of mobile banking. Shareef, Baabdullah, Dutta, Kumar, & Dwivedi (2018) supported Masrek et al.'s claim and argued that while communication with service providers and security were concerns of customers, trust remained the primary issue for

mobile banking adoption. Other researchers purported that bank leaders could benefit from mobile banking by promoting better efficiency and service quality (Malaquias & Hwang, 2019). I examined mobile banking as one of the e-banking services in this study.

Automatic teller machines (ATM). The ATM is created from a combination of technology and electronics (Gumus, Apak, Gumus, Gumus, & Gumus, 2015; Narteh, 2015). Banker leaders posit the ATM as a convenient alternative to in-branch banking for customers to pay bills, transfer funds, make deposits, and withdraw cash (Farajzadeh, 2015; Ram & Goyal, 2016). The technological advances in ATMs evolved over past decade to convert traditional ATMs into smart ATMs, multivendor ATMs, and ATMs for the visual impaired (Hota & Mishra, 2018; Korwatanasakul, 2018).

Despite the benefits of ATMs, there were factors that impacted customer adoption. While Tade and Adeniyi (2017) acknowledged the benefits of ATMs, they found a high degree of fraud associated the machines that impacted the financial industry in India. In their study on elderly customers adoption of ATMs, Huang, Yang, Yang, and Taifeng (2019) found that that introduction of graphics as a learning mechanism did not increase customer usage. Researchers also highlighted ATMs were largely inefficient (Farajzaheh, 2015). In this study I did not examine ATMs as an e-banking service.

Point-of-sale terminals (POS). The POS terminal is a standalone electronic device or integrated system where customer swipe a debit or credit card to pay merchants for goods and services without using cash (Farajzadeh, 2016; Olufemi & Ezekiel, 2017; von Solms, 2016). In their comparative study on customer adoption of electronic payments in China and Germany, Korella and Li (2018) found that credit and debit

transactions at POS terminals were the dominant payment method, whereas in China, consumers adopted non-bank options such as Alipay and WeChat at POS terminals. Similarly, von Solms, noted that POS terminals were the most frequently used method for cashless transactions in South Africa. Conversely, Farajzadeh found that of the 600 POS terminals sampled from the Bank Melli Iran, only 24 or 4% were efficient. Researchers also claimed that there should be ongoing maintenance, such as regular inspections and renewal of components for POS terminals, to prevent customer dissatisfaction and losses for the merchants (Fukushige, Murai, & Kobayashi, 2018). Despite the challenges associated with POS terminals, researchers argued that researchers and practitioners could use the data from the terminals as inputs to predict consumer consumption (Duarte, Rodrigues, & Rua, 2017). I did not examine customer adoption of POS terminals in this study.

E-Banking Adoption in Barbados

Retail banking is no longer a concept associated with brick and mortar institutions where customers visit to perform financial transactions or inquiries OTC. With the evolution of e-banking, bank leaders boast of providing low-cost convenient banking services for their customers to do business anytime and anywhere they chose to bank, however, customer adoption rates in developing countries remained low (Al-Ajam & Nor, 2015; Ozuem, Howell & Lancaster, 2018). Barbados is one of the developing countries in the 15 CARICOM member states with a land mass of 166 square miles, a population size of 286,000, and fiscal deficit of 3% of GDP (Central Bank of Barbados, 2018; The World Bank, n.d). Barbados has an active banking industry comprising of a

central bank, commercial banks, merchant banks, finance companies, trust companies, credit unions, insurance companies, asset management firms, and a stock exchange in its infancy stage (Ghartey, 2018; Wood & Clement, 2015). However, the country's financial development and economic growth outlook remain weak (Central Bank of Barbados, 2019). Researchers recommended that government officials implement incentives to enhance its financial market development and reverse the negative rate (Ghartey, 2018). Like most developing countries in the region, Barbados' banking industry is rapidly evolving with the introduction of digital technology, but there is limited research on e-banking adoption, (Robinson & Moore, 2011).

In 1995, the Central Bank of Barbados issued a report outlining issues anticipated with the introduction of Internet banking in Barbados from a regulators' perspective which included lack of examiner training to effectively supervisor e-banking activities, hidden costs implications for customers, facilitation of unregulated services, and computer fraud (Bayne, 1995). In subsequent studies on e-banking in the Caribbean, researchers found that Barbados was one of four countries that recorded the highest usage of Internet banking (Robinson & Moore, 2011). Researchers also commented on Barbados' ability to advance strategies to implement e-commence (Molla, Taylor, & Licker, 2006) and digital currency using bitcoin (Wood & Brathwaite, 2016). In 2017, Barbados recorded 120,471 fixed phone subscribers and 329,565 mobile phone subscriptions, but the adoption rates remain relatively low in comparison 81,761 Internet users (The World Bank, n.d.). I sought to address the gap in research on e-banking

adoption in Barbados and contribute to the extant literature on the topic of e-banking adoption.

The Impact of Electronic Banking and Banks' Profitability Performance

Technology innovation in the banking industry became a topic of interest for researchers as leaders attempted to respond to the changes due to globalization. Historically, banks were perceived as conservative institutions, highly regulated by government agencies, and demonstrated little or interests in changing the technology platforms (Akhisar et al., 2015). The strategic decisions to implement technology-based applications to reduce in-branch operational costs and risks associated with manual processing was considered revolutionary to a certain extent. Studies conducted on developed and developing countries, therefore, produced varying results on the impact of technology-based applications on the profitability performance of banks by geography and customer demographics (Akhisar et al., 2015; van der Boor et al., 2014).

Empirical evidence from extant literature highlighted the success of technology innovation on the performance of banks in developed countries (Akhisar et al., 2015; Sanchez-Torres et al., 2018; van der Boor et al., 2014). The studies conducted on banks in the United States of America and Europe revealed that technology-based banking services, such as Internet banking increased the assets quality of banks thereby increasing profitability (Akhisar et al., 2015). On the other hand, van der Boor et al. (2014) research highlighted increase profitability for the banks located in France that introduced mobile banking services their customers. There were mixed findings, however, in developing countries. Researchers conducted studies on banks in Jordan, Romania, India, Pakistan

(Akhisar et al., 2015) and on banks in Kenya (van der Boor et al., 2014) and concluded that there were mixed results. Akhisar et al. (2015) found that the technology infrastructure and lack of customer familiarity with electronic banking adversely impacted the implementation of electronic banking. Additionally, some customers were reluctant to use the electronic banking services primarily due to unfamiliarity with the technology and their preference for face-to-face banking (Akhisar et al., 2015). In developing countries, therefore, the impact of technology-based banking was positive for most countries and negative for other countries.

E-Banking Adoption and Strategic Planning

Northouse (2016) and Saxena (2014) claimed that transformational leaders have a unique vision for the future of their organizations and motivate followers to be creative and innovative. Dyer et al. (2016) noted that transformational leaders possess the ability to influence organizational culture by aligning key stakeholders: employees, customers, shareholders, suppliers, and governments to achieve competitive advantage and increase economic profitability. Likewise, McCleskey (2014) agreed with fellow researchers and concluded that transformational leaders possessed the characteristics to increase their followers' efforts at innovation by removing obstacles that negatively impact creativity. Transformational leaders therefore portrayed the qualities to promote innovation through effective strategic planning.

Some researchers claimed that technology innovation is fundamental to a bank's economic performance (Savino, Messeni Petruzzelli, & Albino, 2017) whereas others argued that strategic planning is important to an organization gaining or sustaining a

competitive advantage (Ali Madhi, Abbas, Mazar, & George, 2015; Dyer et al., 2016; Kaiser & Egan, 2013; Styles & Goddard, 2014). The strategic planning process helps leaders formulate and effectively implement innovation technology. Felype Neis, Pereira, and Maccari (2016) concluded that senior bank executives align their strategic planning with their organizational structure to facilitate the implementation of innovation. Kiziloglu (2015) supported Felype Neis et al. (2016) findings but expanded their argument to recommend that leaders in the banking industry considered organizational learning capabilities to help with implementing innovation.

Technology readiness remain an important enabler in the strategic planning objectives for e-banking adoption (Gupta & Garg, 2015). Gupta and Garg (2015) found that optimism and innovativeness were key drivers for technological readiness, while discomfort and insecurity were the main inhibitors of technological readiness. In other studies, on e-banking adoption, researchers highlighted that e-banking was a business strategy to provide quicker, easier, and more reliable financial services to customers (Ozuem et al., 2018). Ozuem et al. (2018) conducted a study to examine the themes underlying strategic planning in a technology-induced environment in Nigeria, and found that efficiency, usability, control, and security were significant drivers for the implementation of Internet banking. Al-Ajam and Nor (2015) investigated the challenges with Internet banking adoption in Yemen, and concluded that bank managers' understanding of the factors that influence customers' behavioral intentions to adopt Internet banking would help facilitate their strategic market planning objectives.

While there remained a gap in extant research on the relationship between innovation and organizational performance, some researchers recommended inclusion of other factors such as culture, communication, leadership styles, regulatory, and external environmental factors as elements to incorporate in future research (Felype Neis et al., 2016; Sanchez-Torres et al., 2018). The inclusion of the above variables would help leaders determine the overall effectiveness of strategic planning on innovation and the performance of banks (Felype Neis et al., 2016). Implementing effective strategic planning would also help banking executives implement the right diversification strategies relative to innovation.

Leaders should continuously explore strategies to sustain a competitive advantage. To reduce high-cost branch-based transactions, leaders should explore diversification strategies either to supplement their revenue. However, not all diversification strategies benefited the banks' performance. Jouida, Bouzgarrou, and Hellara (2017) concluded that activity diversification: investment banking, venture capital, and underwriting insurance as alternative solutions to increase revenue, but the above activities reduced banks' performance. On the other hand, Mustafa (2015) introduced business model innovation as another diversification strategy which involved partnering with telecommunication companies to offer mobile banking to unbanked communities to increase profitability. Unlike Jouida et al. (2017), Mustafa's findings were inconclusive but argued that a business model innovation as a diversification strategy could only be successful if there is an established interdependence model among stakeholders.

From the literature research, I observed that the reduction in high-cost branch-based transactions is a specific business problem facing banking executives, and historically there was empirical evidence of success in developed countries and most developing countries. Other innovation diversification strategies failed to increase profitability, but banking executives are encouraged to develop business strategies that will positively impact their banks' revenues. In this study, I focused on understanding the factors that affect adopt e-banking services in Barbados using the TAM as the contextual framework. My aim was to contribute to the gap in the extant literature.

Methodologies Used in Research on E-banking Adoption

Several factors affect e-banking adoption, therefore, utilizing various research methods: quantitative, qualitative, or mixed-methods, to help researchers determine the relationship between variables. A quantitative method is applicable when researchers seek to test hypotheses, examine causal relationships between or amongst variables, and predict outcomes using surveys and questionnaires (Else-Quest & Hyde, 2016; Park & Park, 2016). Researchers extensively used quantitative method to examine factors affecting user adoption of e-banking (Belas et al., 2015; Kurila et al., 2016; Padmaja et al., 2017; van Tonder et al., 2018; Zallaghi, 2018). Sanchez-Torres et al. (2018) examined the impact of trust, performance expectancy, effort expectancy, and government support on e-banking adoption in Colombia. The authors found that trust, performance expectancy, and effort expectancy had a positive impact on e-banking adoption. the impact of government support was insignificant (Sanchez-Torres et al., 2018). Likewise, Marunyane and Yuanqiong (2018) examined the effect of counter-conformity,

motivation, website social feature, ease of use, and e-customer service on consumer

intention to adopt e-banking in China. The authors concluded that counter-conformity,

website social feature, and e-customer service were significant factors that influenced e-

banking adoption. In this study, I examined the factors that affect e-banking adoption in

Barbados, therefore, a quantitative method was appropriate.

Researchers use a qualitative method to understand the perspectives of

participants or situations by gathering data through non-statistical approaches including

interviews or direct observations (Park & Park, 2016). Qualitative researchers identify

underlying reasons and motivations to provide insights for a problem, generate ideas for

later quantitative research, and uncover trends in thoughts and opinions (Park & Park,

2016; Peticca-Harris, deGama, & Elias, 2016). Patel and Brown (2016) conducted a

qualitative phenomenological study to investigate the factors that influenced the choice of

adopting of a particular banking channel. The authors found that comparative advantages

of channels, compatibility with personal preferences, and transactions being performed

customers, sub-consciously and consciously influenced customers evaluation of the

channel before selection (Patel & Brown, 2016). A qualitative method was not suitable

for this study because I did not attempt to understand the underlying reasons or

perceptions why customers adopt e-banking services in Barbados.

Mixed methods studies include a combination of quantitative and qualitative

research methods and used to investigate phenomena at the micro and macro levels

(Whiteman, 2015). In mixed method studies, researchers collect statistical data using

elements of quantitative method (surveys, questionnaires), and nonstatistical data using

elements of qualitative method (interviews, observations) for analysis (Johnson, 2015; Mauceri, 2016). Shetty and Sumalatha (2015) conducted a mixed method empirical study to collect customers' opinions on e-banking adoption, its importance, and problems associated with e-banking in Brahmavar. The findings showed that customers were satisfied with the convenience of e-banking but dissatisfied with the threat of fraud and bank related errors (Shetty & Sumalatha, 2015). In this study, a mixed methods approach was not suitable because I did not undertake a qualitative methodology

Transition

In this quantitative correlational study, I intended to examine the relationship between PU, PEOU, and e-banking adoption. In section 1, I provided an overview of the foundational aspects of the study that included the problem and purpose statements, the nature of the study, and the research question. Section 1 also contained the theoretical framework, the significance of the study, and the literature review relative to the research question. Section 2 contained the role of the researcher, the study participants, the methodology, and design for this study, as well as the ethical procedures. The section also contained a detailed discussion on the population sampling, data collection instruments, data organization, and analysis techniques, concluding with reliability and validity. Section 3 covered the presentations of findings, application to professional practice, implications for social change, recommendations for action, recommendations for further research, reflections, and conclusion.

Section 2: The Project

The project section of the study begins with a reinstatement of the purpose of the study. I described my role as the researcher and the selection criteria for prospective participants. I discussed the research methodology and design and justified my selection of a quantitative method and a correlational design to examine the relationship between PU, PEOU, and customer adoption of digital banking services in Barbados. Section 2 also contains a discussion on the population and sampling, data collection instruments, and the techniques that l used to collect, organize, and analyze the data. I concluded the section with a discussion on the validity and reliability of the instruments used in the study.

Purpose Statement

The purpose of this quantitative correlational study was to examine the relationship between PU, PEOU, and customer adoption of e-banking services in Barbados. The predictor variables were PU and PEOU. The dependent variable was e-banking adoption. The target population was retail banking customers in Barbados with access to smartphones, tablets, laptops, or desktop computers who had at least one bank account. The implications for social change included the potential to provide an improved understanding of e-banking services to Barbadian residents, to increase awareness of the availability of e-banking services to retail banking customers in Barbados, and to create access to affordable financial services for individuals in Barbados.

Role of the Researcher

The role of a quantitative researcher is to design the data collection approach, select participants, analyze the data using statistical or mathematical techniques, and

report findings to validate the research hypotheses (Saunders et al., 2015, Zyphur &

Pierides, 2017). Saunders et al. (2015) suggested that researchers recognized personal

biases which could impact the data collection process. In this quantitative correlational

study, I collected, organized, analyzed, and interpreted data from convenience sampling

participants in Barbados to determine the factors that influenced customer adoption of e-

banking services. I used a validated instrument to collect data and tested the research

hypotheses using computerized statistical software to maintain data integrity during the

analysis process (Saunders et al., 2015, Zyphur & Pierides, 2017).

I am a resident of Barbados, a senior leader in one of the island's largest retail

banks, and a user of e-banking services. I used convenience sampling to collect data,

therefore, I had no relationship with the participants. I examined the factors that

influenced customer adoption of e-banking services in Barbados to help retail banking

leaders develop strategies to increase e-banking adoption.

Researchers must adhere to the ethical principle, rules, guidelines, and protocols

that govern research studies. The Belmont Report (U.S. Department of Health and

Human Services, 1979), states that researchers must understand the boundaries between

practice and research, comply with the ethical standards and guidelines to protect

participants in research studies as it relates to respect for individuals, beneficence, and

justice, as well as demonstrate an understanding of the above principles and guidelines in

their research studies through means of informed consent, risk mitigation, and selection

of participants.

Saunders et al. (2015) noted that researchers should submit their proposals for ethical review and comply with a university's ethical guidelines. To conduct this study, I followed the ethical principles and guidelines outlined in the Belmont report and Walden University's ethical code of conduct. I requested permission from the Institutional Review Board (IRB) at Walden University before I commenced the data collection process. In the introductory statement of the survey, I outlined the purpose of the research study, the rights of participants, and obtained their informed consent to participate in the study as per researchers' recommendations (Saunders et al., 2015; Yin, 2018). I encouraged open and honest feedback in the survey and confirmed anonymity of the responses to alleviate concerns with bias that could negatively impact the reliability of the research findings.

Participants

The selection of appropriate participants who align with the research question was critical to the outcome of this study. Researchers use eligibility criteria to select qualified participants for their studies (Saunders et al., 2015; Yin, 2018). Participants' eligibility criteria include demographics (age, gender, race, education level, employment status, income category, geographical location, and language) and behavioral characteristics relevant to the research study (Farah et al., 2018; Jansen & van Schaik, 2018; Kiziloglu, 2015; Malaquias & Hwang, 2019; Sinha & Mukherjee, 2016; Tan & Lau, 2016). Researchers who aligned the eligibility criteria to the research question minimized the risk associated with misrepresentation of participants in the selection process and created a standardized approach to ensure all participants met the same eligibility criteria (Yin,

2018). For this study, the eligibility criteria included (a) individuals who lived in Barbados, (b) owned at least one bank account at any of the retail banks, (c) possessed a mobile smartphone, laptop, and/or a desktop computer, (d) used e-banking services (mobile or online banking), and (e) were 18 years of age or older.

Active use of e-banking services could indicate customers' satisfaction with this form of banking (Alkailani, 2016; Danyali, 2018; Olufemi & Ezekiel, 2017). To gain access to qualified participants, researchers distribute surveys using email invitations, face-to-face handouts, telephone interviews, or social media networks (Jansen & van Schaik, 2018; Ozlen & Djedovic, 2017; Rodrigues et al., 2016; Shaw & Sergueeva, 2019). Symonds (2011) claimed that SurveyMonkey was an appropriate data collection tool for researchers to use to gather participants' responses and opinions, while Hendricks, Duking, and Mellalieu, (2016) found that Twitter was a suitable tool for survey-based research. For this study, I used SurveyMonkey to distribute the online questionnaires via social media networks (Twitter, LinkedIn, and Facebook) to gather participants' responses for data analysis.

Researchers establish working relationships with participants to gain trust and improve the quality of interactions (Srinivasan, Loft, Jesani, Johari, & Sarojini, 2016; Yin, 2018). To establish a working relationship with the participants, I introduced myself, described my role as the researcher, the purpose of the study, and indicated that participation is voluntary. I also stated that participants' responses were anonymous and confidential as per researchers' recommendations (Alkailani, 2016; Jansen & van Schaik, 2018). I included prescreening demographical questions to exclude illegible respondents

to preserve data integrity. I designed the survey to only permit eligible participants who consented to take the survey to proceed with completion of the questionnaire. Participants had access to IRB's email and telephone contact details to reach them for clarification before the survey process. I also granted participants the option to obtain a copy of the survey when completed. Participants' responses helped me determined the factors that influenced customer adoption of e-banking services in Barbados.

Research Method and Design

Researchers select the appropriate research method and design to support the outcome of their studies. Saunders et al. (2015) discussed the three research methods: (a) quantitative, (b) qualitative, and (c) mixed methods that researchers use to collect data for analysis. Researchers also adopt a design approach that aligns with the research method to produce the appropriate results (Hitchcock, Onwuegbuzie, & Khoshaim, 2015; Kelemen & Rumens, 2012; Yin, 2018). In this study, I employed a quantitative method and correlational design to examine the statistical relationship between predictor variables and a criterion variable.

Research Method

Researchers use a quantitative method to examine possible statistical relationships between two or more variables (Halcomb & Hickman, 2015; Karadas, Celik, Serpen, & Toksoy, 2015; Onen, 2016). Babones (2016) claimed that quantitative research aligns with studies that test hypotheses using survey questionnaires, experiments, or observations to determine the outcome of the study. Researchers also use a quantitative method to gather data using a sampling approach that aligns with the research questions

(Apuke, 2017; Kohler, Landis, & Cortina, 2017) to generalize the results for a specific population (Danyali, 2018; Shaw & Sergueeva, 2019). In recent research studies on customer adoption of e-banking, researchers found that a quantitative methodology was appropriate to test their hypotheses regarding the relationships between the independent and dependent variables (George & Kumar, 2015; Sinha & Mukherjee, 2016; Teo, Tan, Ooi, Hew, & Yew, 2015; Tseng, 2015). In this study, I used a quantitative research method to examine the statistical relationships between PU, PEOU, and customer adoption of e-banking services in Barbados.

Researchers who conduct qualitative studies attempt to explore and understand events, organizations, phenomena, or processes to provide empirical evidence on how to address the problem or situation (Cardno, 2018; Morse, 2015; Yin, 2018). A qualitative methodology aligns with an interpretive philosophy where the researchers seek to make sense and meaning of phenomena using an inductive approach (Jamali, 2018; Saunders et al., 2015; Yin, 2018). Qualitative researchers also rely on their participants' opinions, lived experiences, or perspectives to collect and analyze data to create a generalization of the findings on a specific population (Jamali, 2018; Johnson, 2015; Kelley-Quon, 2018; Reis, Amorim, & Melao, 2019). I aimed to examine the statistical relationship between variables; therefore, a qualitative method was not a suitable research method for this study.

Mixed methods researchers incorporate a combination of a qualitative and a quantitative method to collect and analyze data to produce conclusive results on their overarching research question (Archibald & Gerber, 2018; Hitchcock et al., 2015; Thiele,

Pope, Singleton, & Stanistreet, 2018). Researchers adopt a mixed method approach to understand and solve complex social phenomena using a deductive and inductive approach to address perceived weaknesses with a single research method approach (Alavi, Archibald, McMaster, Lopez, & Cleary, 2018; Mekki, Hallberg, & Oye, 2018; Thiele et al., 2018). According to Archibald and Gerber (2018), mixed-method research is suitable for providing an in-depth holistic view of complex problematic human conditions, and researchers use this approach to develop professional knowledge to address the associated issues. I did not select a mixed method approach because I did not explore the complexities of a social phenomenon nor live experiences to respond to my research question.

Research Design

Researchers select a research design that aligns with establishing a framework for data structuring, analysis, and interpretation (Bryman, 2016; Saunders et al., 2015; Yin, 2018). There are three main types of research designs in quantitative studies: (a) correlational, (b) experimental, and (c) quasiexperimental (Johnson & Christensen, 2017; McCusker & Gunaydin, 2015). While each design requires power analysis to select the accurate sample sizes, differences exist between each design technique (Johnson & Christensen, 2017; McCusker & Gunaydin, 2015). A correlational design is appropriate for researchers to examine the statistical relationship between independent and dependent variables; it does not imply causality and it incorporates multiple regression, logistic regression, and discriminant analysis (Bryman, 2016; Johnson, & Christensen, 2017; McCusker, & Gunaydin, 2015; Saunders et al., 2015; Yin, 2018). Researchers stated that

correlational studies involve data collection from specific populations (Bleske-Rechek, Morrison, & Heidtke, 2015; Ladd, Roberts, & Dediu, 2015). In recent studies on customer adoption of e-banking, researchers used a correlational design to examine the statistical relationship between the predictor and criterion variables (Afshan & Sharif, 2016; Ahmadi Danyali, 2018; Shareef et al., 2018; van Tonder, Petzer, van Vuuren, & De Beer, 2018). In this quantitative research study, I used a correlational design to examine the significance of the relationship between the PU, PEOU, and customer adoption of e-banking services in Barbados.

Researchers use an experimental design to assess cause and effect relationships between independent and criterion variables (Bryman, 2016; Saunders et al., 2015; Yin, 2018). An experimental design is appropriate for randomly assigning groups, and researchers use power analysis to determine the sample size (Omair, 2015; Rockers, Røttingen, Shemilt, Tugwell, & Bärnighausen, 2015). Zellmer-Bruhn, Caligiuri, and Thomas (2016) found that researchers use experimental design to manipulate the independent variables to control the outcome of the study. Similar to experimental design, researchers use a quasiexperimental design to investigate causal effects among groups of variables, use power analysis to determine the sample size, and manipulate the independent variables to influence the study's outcome (Omair, 2015; Rockers et al., 2015; Zellmer-Bruhn et al., 2016). I did not attempt to investigate a cause and effect relationship nor control independent variables through manipulation; therefore, an experimental or a quasiexperimental design was not suitable for this study.

Population and Sampling

Researchers identify the population for their studies to align with their research topic. The population of this study consisted of adult individuals residing on the island of Barbados. According to the World Bank (2017), the number of internet users in Barbados represented 79.5% of the total population, and 118, 200 individuals were mobile banking subscribers. Five retail banks are operating in Barbados with e-banking services, and customers tend to own accounts at multiple banks (Central Bank of Barbados, 2019). Other financial institutions include credit unions, insurance companies, and finance agencies with limited online banking services. The target population included adults who are retail banking customers with at least one bank account, owned a mobile smartphone, and had access to online and mobile banking. Customers who conducted business only with non-retail banking financial institutions did not form part of the target population because of the limited access to e-banking services. The target population aligned with the research question and was eligible to participate in the data collection process to help determine the factors that influence customer adoption of e-banking services in Barbados.

There are two methods of sampling in research: nonprobabilistic or nonrandom sampling and probabilistic or random sampling (Bryman, 2016; Haegele & Hodge, 2015; Saunders et al., 2015). Nonprobabilistic sampling includes four types of sampling techniques: convenience, purposive, quota, and snowball (Bryman, 2016; Saunders et al., 2015; Van Hoevan, Janssen, Roes, & Koffijberg, 2015), while the probabilistic method includes simple random sampling, stratified sampling, systematic sampling, and cluster sampling (Bryman, 2016; Haegele & Hodge, 2015; Saunders et al., 2015). Researchers

use nonprobabilistic sampling in quantitative studies to collect data in a cost-efficient

manner (Brick, 2015; Catania, Dolcini, Orellana, & Narayanan, 2015; Etikan, Musa, &

Alkassim, 2016; van Tonder et al., 2018), but theorists claimed that probabilistic

sampling is the better method for empirical data collection because researchers could

generalize their findings (Fielding, Beattie, O'Reilly, McMaster, & The AusQoL Group,

2016; Haegele & Hodge, 2015). For this study, I adopted a convenience sampling

technique to collect empirical data from the target population. In prior studies on the

adoption of e-banking, researchers used convenience sampling to obtain responses from

participants who volunteered to complete their surveys (see Farah et al., 2018; Maduku,

2017; Marafon et al., 2018; Sharma et al., 2015; van Tonder et al., 2018).

The appropriate sample size creates reliable conclusive results (Hazra, & Gogtay,

2016). Researchers use G*Power, a statistical software package, to conduct an apriori

sample size analysis in quantitative studies (Faul, Erdfelder, Buchner, & Lang, 2009;

Macfarlane et al., 2015). I conducted a power analysis using G*Power version 3.1.9

software to determine the appropriate sample size for this study. An a priori power

analysis, assuming a medium effect size ($f^2 = .15$), $\alpha = .15$, and two predictor variables,

identified that a minimum sample size of 68 participants is required to achieve a power of

.80. Increasing the sample size to 146 will increase power to .99. Therefore, I sought

between 68 and 146 participants for the study (Figure 1).
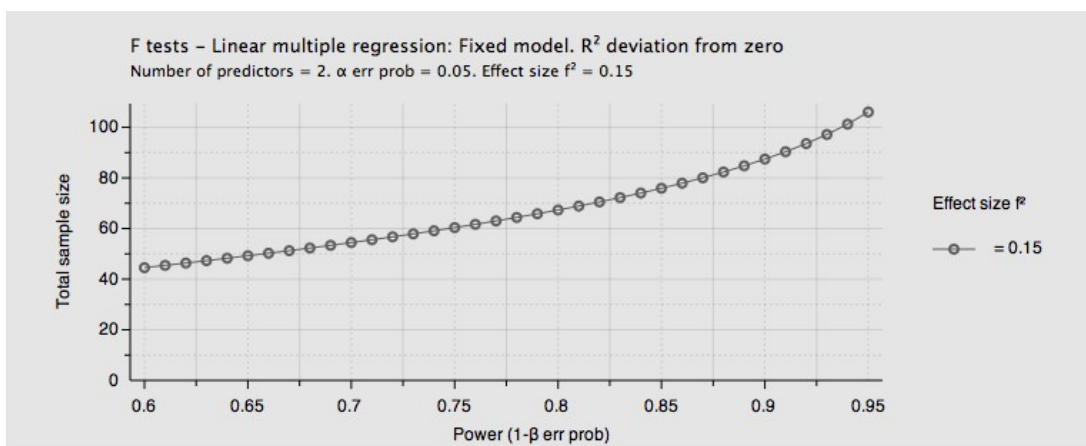
Figure 1. Power as a function of sample size.

The effect size influences the research design (Bosco, Singh, Aguinis, Field, & Pierce, 2015). Leppink, O'Sullivan, and Winston (2016) noted that effect size varies from study to study; therefore, I used a medium effect size ($f^2 = .15$) for this study based on the analysis of Faul et al. (2009) where predictors are the outcome measurement with a sample size of between 68 and 146 for data analysis.

Ethical Research

To produce a credible research study, a researcher must adhere to the ethical standards and guidelines that govern the rights of participants in the data collection process. Nicolaides (2016) stated that the researcher should protect participants' identities, interests, and rights throughout and following the data collection process. I adhered to the guidelines in the Belmont Report (U.S. Department of Health and Human Services, 1979) that outlines how to protect the rights of individuals, beneficence, and justice. I also complied with Walden University's IRB code of ethics procedures and commenced the data collection phase after I received approval from IRB. Walden

University's IRB approval number is 03-19-20-0752189 and it expires on March 18, 2021.

In this study, I allowed participants to complete the survey without prejudice. I used social media to distribute the survey to adult individuals who might qualify to participate in the study. I designed the consent form in the participants' language to avoid issues with ambiguity or misinterpretation of the information as per researchers' recommendations (see Afshan & Sharif, 2016). I administered the survey using SurveyMonkey®, which has 24-hour firewall protection (Mahon, 2014; Symonds, 2011). The first page of the survey required participants to indicate their consent to participate willingly in the survey. The consent form included the purpose of the survey and stated that it is voluntary and anonymous. I included a confidentiality notice on the consent form to inform participants that I will store the data in an encrypted format on a secured hard drive for 5 years. I granted access to the survey questionnaire after participants confirmed that they read and understood the contents of the form.

The data collection process of this study was strictly voluntary. Harriss and Atkinson (2015) stated that participants should be aware that they could withdraw from a study at any time during the research process. I included a notice to eligible participants of their right to withdraw at any time during the survey process. I did not request participants to provide reasons for withdrawing nor did I invoke penalties or send follow up reminder emails requesting that they reconsidered taking the survey. I provided options for participants to withdraw from the survey by selecting "decline" to the consent form, closing the survey, or by not responding to the questions. I sent email reminders on

the social networks for participants to complete the survey and used SurveyMonkey® to save responses during the process. I deactivated the IP address tracer on SurveyMonkey® to protect the identity of participants and for those who chose to withdraw from the survey to make their information untraceable.

Researchers and academics are yet to agree if financial incentives make studies more robust and ethical (Zutlevics, 2016). Resnik (2015) argued that while financial incentives might increase participation in a research study, the risk of inducing and exploiting participants create ethical challenges for researchers. In recent quantitative studies on e-banking, researchers did not include incentives in their data collection process (Baabdullah et al., 2019; Boosiritomachai & Pitchayadejanant, 2017; Choudrie et al., 2018; Mehrad & Mohammadi, 2017; Shareef et al. 2018; van Tonder et al., 2018). I included a statement on the consent form indicating that there would be no financial incentives for completing the survey.

The researcher should demonstrate an understanding of the ethical standards and guidelines associated with protecting the rights and interests of participants in their studies (U.S. Department of Health and Human Services, 1979). As an academic researcher, I provided evidence of compliance by presenting my certificate from the Collaborative Institutional Training Initiative (CITI) online training course regarding protecting the dignity and rights of human study participants. I produced evidence to show I obtained permission granted from MIS Quarterly Carlson School of Management University of Minnesota to adopt Davis' (1989) TAM Final Measurement Scale for

Perceived Usefulness and Perceived Ease of Use. I also provided my IRB approval

number to conduct this quantitative study.

Data Collection Instruments

Data collection is an important component of quantitative research. The scales of

measurement should align with the research question to produce accurate statistical

analyses (Saunders et al., 2015). Farah et al. (2018) and Thomas, Oenning, and de

Goulart (2018) recommended that researchers examine the extant literature for

academically validated instruments before creating a new instrument for primary data

collection. Experts in the fields of information technology, psychometrics, and system

development validated the TAM survey (see McCoy, Marks, Carr, & Mbarika, 2004;

Ong, Muniandy, Ong, Tang, & Phua, 2013), and it has been widely accepted by

researchers, academics, and practitioners as a suitable instrument for primary data

collection (see Alkailani, 2016; Chauhan, 2015; Malaquias & Hwang, 2019; Ozlen &

Djedovic, 2017; Priya, Gandhi, & Shaikh, 2018; Ramos et al., 2018). The reliability of

the TAM survey instrument has a Cronbach's alpha value of .843 (Ong et al., 2013). I

chose the TAM questionnaire due to its reliability and validity as a primary data

collection instrument for predicting customer adoption of e-banking services.

The TAM model has two exogenous scaled constructs: PU, PEOU, and two

endogenous scaled constructs: attitude (ATT) and behavioral intention (BI) to predict the

use of technology (Chauhan, 2015; Mansour, 2016; McCoy et al., 2004; Priya et al.,

2018). Researchers examine PU to determine users' perceptions about their experiences

based on the outcome from interaction with technology (Chauhan, 2015; Mansour, 2016;

Ozlen & Djedovic, 2017; Rodrigues et al., 2016). PU also measures the probability that

using technology would improve the way a user completes a task (Alkailani, 2016;

Chauhan, 2015; Mansour, 2016; Ozlen & Djedovic, 2017; Rodrigues et al., 2016). PEOU

defines the significance that a user believes that using technology would be effortless

thereby seeing it as useful (Alkailani, 2016; Chauhan, 2015; Mansour, 2016; Ozlen &

Djedovic, 2017; Rodrigues et al., 2016). Section 1 of the survey included demographic

attributes and experience. In section 2, I covered two subsections, one for the attributes

for PU: (a) speed of systems, (b) systems' performance, (c) productivity, (d) effectiveness

of systems, (e) ease of doing tasks, and (f) useful of systems. The other subsection

consisted of the attributes for PEOU: (a) meets the needs of users, (b) easy to understand,

(c) flexible, (d) improves user skills, and (e) easy to use. I measured the constructs with

an ordinal 5-point Likert scale that ranged from 1 = *strongly disagree* to 5 = *strongly*

agree. A high score indicated a higher degree of willingness to adopt e-banking services.

  While retail banking leaders continue to invest annual budgets to improve the

infrastructure of online and mobile banking platforms, the customer adoption of these

services remains low (Mullan et al., 2017; Olufemi & Ezekiel, 2017; Onyango &

Wanjira, 2018). Davis (1989) argued that consumers adopted a system or application

primarily because of its functions and the ease by which it performed the functions. Sihna

& Mukherjee (2016) stated that the TAM model is known as a well-established, robust,

powerful, and parsimonious model for predicting user acceptance. Quantitative

researchers adopted the TAM questionnaire as the suitable data collection instrument in

their studies to examine user acceptance of technological changes (Almazroi, Shen, Teoh,

& Babar, 2016; Ibanez, Serio, Villaran, & Delgado-Kloos, 2016). Laksono, Priadythama, & Azhari (2015) used the modified TAM questionnaire to test whether users accepted the use of props for learning media, while Wang, Huang, & Hsu (2017) developed a modified TAM questionnaire to examine students' acceptance of mobile color games as a form of learning. In prior research on the adoption of e-banking services, researchers used the TAM questionnaire to examine customer acceptance of e-banking services (Cristovao-Verissimo, 2016; George & Kumar, 2015; Salimon, Yusoff & Mohd Mokhtar, 2017). For this study, the TAM questionnaire was appropriate to examine the relationship between PU, PEOU, and customer adoption of e-banking services in Barbados.

I administered the survey instrument online using SurveyMonkey® to distribute the modified questionnaire. The survey remained open for 14 days to allow participants to complete the survey at their convenience; they also had the option to stop and continue the survey without restrictions. Researchers used SurveyMonkey® as the data collection instrument to investigate events, phenomena, or business-related problems associated with the adoption of technological changes (Mahon, 2014; McDowall & Murphy, 2018). SurveyMonkey® has a secured data server with 24-hour firewall protection and is suitable to store participants' responses without compromising the data (Mahon, 2014; McDowall & Murphy, 2018). At the end of the survey period, I downloaded the participants' responses from SurveyMonkey® to SPSS statistical software.

Krasiukova (2017) suggested that researchers use SurveyMonkey® for increased quality in questionnaires and analyze the data using statistical software such as the SPSS application. Aadnanes, Wallis, and Harstad (2018) applied SurveyMonkey® and SPSS

statistical software for data collection and analysis in their quantitative study. I calculated

the scores using the naming convention in SPSS statistical software. PU and PEOU were

the independent variables, and customer adoption of e-banking was the dependent

variable. I calculated the scores for PU, and PEOU using the legend: "Yes", "No", and

"?" and converted them in SPSS for analysis. I coded "Yes" as 1, "No" as 0, and "?" as 3.

The survey did not include a provision for free format text; therefore, there was no need

to assign reverse codes for negative words or comments.

In quantitative research, the credibility of the study should withstand the peer

scrutiny to ensure the research instrument tested all variables, measured the criterion

variable, and is comparable to other tools that test the same constructs (Heale &

Twycross, 2015; Zyphur & Pierides, 2017). In this study, I used Cronbach's alpha

coefficient to measure the reliability of the TAM instrument. The Cronbach's alpha

coefficient measures the internal consistency of a research instrument and establishes

reliability (Heale & Twycross, 2015; Vaske, Beaman, & Sponarski, 2017; Venkatesh, &

Bala, 2008). Davis (1989) created and validated the TAM questionnaire with a Cronbach

alpha of .97 for PU and .93 for PEOU. Cooper, Collins, Bernard, Schwann, and Knox

(2019) and Heale and Twycross (2015) noted that .70 is the minimum acceptable

Cronbach's alpha coefficient while between .80 and .90 are considered desirable.

Previous researchers used Cronbach's alpha coefficient to test the reliability of the data

collection instruments in their studies on e-banking adoption (Chechen et al., 2016;

George & Kumar, 2015; Ling, Fern, Boon, & Huat, 2016; Salimon et al., 2018; Shaw &

Sergueeva, 2019; Tan & Lau, 2016; Yadav, 2016). Cronbach alpha was, therefore, appropriate to measure the reliability of the survey instrument in this study.

The important components for evaluating the quality of quantitative research are content validity, construct validity, and criterion-related validity. Researchers stated that validity confirms if the instrument accurately measures the concept in a quantitative study (Bryman, 2016; Cooper et al., 2019; Heale & Twycross, 2015; Saunders et al., (2015). Content validity is concerned with the instrument adequately covering all the variables (Heale & Twycross, 2015; Bryman, 2016; Saunders et al., 2015). Construct validity determines if the researcher can draw inferences about the test scores related to the concept either through homogeneity, convergence evidence, or theory evidence (Bryman, 2016; Heale & Twycross, 2015; Saunders et al., 2015). Criterion-related validity refers to the measurement of the same variables by other instruments in three ways: divergent, convergent, or predictive validity (Bryman, 2016; Heale & Twycross, 2015; Saunders et al., 2015). Cooper et al., (2019) stated that a criterion-related validity coefficient $(r) > .45$ is an acceptable measure in research. Researchers consider a study of good quality when they address the reliability and validity with the tools or instruments used in the study (Heale, & Twycross, 2015; Johnson, 2015; Morse, 2015; Saunders et al., 2015; Zyphur & Pierides, 2017). In this quantitative study, I relied on the validity of previous researchers (Bryman, 2016) and provided evidence to address the reliability and validity of the TAM instrument in an attempt to examine the relationship between PU, PEOU, and customer adoption of e-banking in Barbados.

I intended to make slight modifications to the TAM instrument to reflect the purpose of this study and aligned the questionnaire to the research questions on the PU and PEOU constructs to address concerns with reliability and validity (Appendix A). Researchers modified the TAM constructs in their studies to include constructs from other theoretical frameworks to investigate the factors that influenced user intention to adopt technological changes. Baubeng-Andoh (2018) extended the TAM questionnaire to include constructs from the theory of reasoned action; attitude towards use and behavioral intention. George (2018) extended the TAM questionnaire to include service quality as an external variable. Other researchers modified the TAM questionnaire to include other constructs such as personality traits (Moslehpour, Pham, Wong, & Bilgicli, 2018; Salimon et al., 2018) and compatibility (Cristovao-Verissimo, 2016). Modification to the TAM questionnaire was acceptable for this study.

Before commencing use of the TAM questionnaire in the data collection process for this study, I requested permission from MIS Quarterly Carlson School of Management University of Minnesota to adopt Davis' (1989) TAM "Final Measurement Scale for Perceived Usefulness and Perceived Ease of Use" (Appendix B). I modified the questionnaire to an online survey to reflect questions relevant to customer adoption of e-banking and distributed it using SurveyMonkey® to eligible participants who volunteered and consented to take the survey. I stored the survey data on a password-protected computer and encrypted flash drive for ease of retrieval when formally requested and destroy of the information after 5-years.

Data Collection Technique

The data collection technique covers the process to collect data for research. In this study, I used SurveyMonkey®, a web-based database, to collect data for analysis. In prior research on customer adoption of e-banking services, researchers used web-based surveys for data collection (Chechen et al., 2016; Jansen & van Schaik, 2018; Marafon, Basso, Espartel, de Barcellos & Rech, 2018; Shaw & Sergueeva, 2019). I distributed the survey on social media network sites (Facebook, Twitter, LinkedIn) for a period of 14 to 28 calendar days, I asked participants to complete the survey within 14 calendar days, and I indicated the average time it took to complete the survey. I designed the survey into three main sections. Section 1 covered six demographic questions, section 2 included six questions on PU of e-banking services, and section 3 consisted of six questions on PEOU of e-banking services. The survey was compatible and accessible on laptops, desktop computers, and mobile devices for ease of completion. By Day 8, I sent reminder emails to participants to complete the survey. Some researchers suggested the use of text messages to send reminders to participants to complete surveys (Langenderfer-Magruder & Wilke, 2019). I did not use text messages because I did not intend to request participants' mobile telephone numbers in the demographics section of the survey to safeguard participants' privacy. If I did not receive the required number of valid responses by day 14, I would have kept the survey open for an additional 7 to 14 calendar days until I collected at least 150 valid responses to meet the study's criteria of between 68 to 146 valid responses. I downloaded the data from SurveyMonkey® into Excel and

uploaded it into the IBM SPSS version 24 statistical software to conduct a multiple aggression analysis.

Researchers apply web-based surveys in their studies as a viable alternative to traditional paper-based techniques (McDowall & Murphy, 2018; Thu, Thuy, Huong, An, & Andreas, 2018). Researchers claimed that web-based surveys have several advantages: (a) cost-efficient, (b) convenient, (c) better suited for large population, (d) rapid data collection, and (e) easily accessible by participants (Handscomb et al., 2016; McDowall & Murphy, 2018; Thu et al., 2018). Researchers found that web-based surveys allowed for automated storage of responses, limited handling of data, and ease of data transfer to statistical applications for data analysis (O'Brien et al., 2016). Guo, Kopec, Cibere, Li, & Goldsmith (2016) and McPeake, Bateson, and O'Neill (2016) noted that a web-based survey could be configured for browsers on mobile devices to give participants the convenience of completing the survey using their tablets or mobile smartphones. The disadvantages associated with web-based surveys are inadequate sample sizes, low response rates, and other additional biases that may negatively impact the participants' responses (McDowall & Murphy, 2018; Thu et al., 2018).

Researchers claimed that web-based surveys are not suitable for open-ended questions because the interviewer is not present to probe for answers (Pursey, Burrows, Stanwell, & Collins, 2014; Wallace, Cesar, and Hedberg, 2018). Tran, Porcher, Falissard, and Ravaud, (2018) found that web-based surveys are not suitable for open-ended questions because participants' experiences are restricted; researchers do not purposefully choose participants, and data collection and analysis is sequential instead of using

iterative cycles. Researchers who use web-based surveys exclude individuals with no Internet access from the data collection process (McDowall & Murphy, 2018). McPeake et al. (2014) claimed that a web-based survey could potentially increase the risk of fraud for Internet users. To address the limitations of using a web-based survey in this study, I redistributed the survey until I have the required sample size, I did not ask open-ended questions, and participants without Internet access did not meet the eligibility criteria for data collection.

Quantitative researchers conduct pilot surveys to establish the reliability and validity of the research instrument (Bryman, 2016; Saunders et al., 2015). In recent quantitative research studies on the customer adoption of e-banking, some researchers conducted pilot surveys on an average of 50 participants and validated the survey instrument with a Cronbach above .70 (Chauhan, 2015; Chechen et al., 2016; Priya et al., 2018; Sinja & Mukherjee, 2016). Other researchers relied on previously validated studies by experts in the information technology and banking industry (Alkailani, 2016; Danyali, 2018; Malaquias & Hwang, 2019; Mansour, 2016; Ozlen & Djedovic; 2017; Ramos et al., 2018). For this study, I relied on the validated research from the extant literature and did not perform a pilot study after IRB approval.

Data Analysis

The overarching research question of this study is: What is the relationship between PU, PEOU, and customer adoption of electronic banking in Barbados?

The null and alternative hypotheses are as follows:

(H₀): There is no statistically significant relationship between PU, PEOU, and customers' adoption of e-banking services.

(H₁): There is a statistically significant relationship between PU, PEOU, and customers' adoption of e-banking services.

In this quantitative correlation study, I used multiple regression analysis to examine the relationship between the independent variables: PU and PEOU, and the dependent variable, customer adoption of e-banking services. Researchers use the multiple linear regression analysis to examine the relationships between two or more independent or predictor variables and a continuous dependent or criterion variable in experimental and nonexperimental studies (Alhamide, Ibrahim, & Alodat, 2016; Anghelache, Manole, & Anghel, 2015; Khan & Zubaidy, 2017; Mahmoudi, Maleki, & Pak, 2018; Pina-Monarrez, Avila-Chavez & Marquez-Luevano, 2015). There are three types of multiple linear regression techniques: standardized or simultaneous regression, hierarchical regression, and stepwise linear regression (Ching-Kang, Lai, Shen, Tsang, & Yu, 2017; Green & Salkind, 2017; Saunders et al., 2015). The primary purpose of conducting multiple linear regression analyses is to ensure there is validity in research (Green & Salkind, 2017; Saunders et al., 2015). In prior studies on the adoption of e-banking, researchers used multiple regression analysis to examine the relationship between variables. Changchit, Lonkani, and Sampet (2017) adopted multiple regression analysis to explore the determinants for the usage of mobile banking, Arora and Sandhu (2018) and Dumicic, Ceh-Casni, and Palic (2015) employed multiple regression analysis

to investigate the reasons for consumer usage of Internet banking. Multiple regression analysis was, therefore, appropriate for this study.

Other statistical techniques used in quantitative studies include independent sample t-test, analysis of variance (ANOVA) tests, bivariate linear regression, Pearson's correlation, discriminant analysis, and factor analysis (Green & Salkind, 2017; Saunders et al., 2015). The independent sample t-test is the appropriate statistical analysis when the research question is to determine if a difference exists between a dependent variable and independent variables by analyzing dichotomous data (Bakker & Wicherts, 2014; Mahmoudi, Maleki, & Pak, 2018). The independent t-test was not appropriate for this study because I did not attempt to determine if a difference existed between variables. When comparing mean differences between more than two groups of dependent and independent variables, or if a sample is measured repeatedly on several occasions to compare the means in the groups or from various occasions, ANOVA is the appropriate testing technique (Anders, 2017; Danila, Ungureanu, Moraru, & Voicesce, 2017; Pandis, 2015). The ANOVA was therefore not suitable for this study because I did not test differences between groups or measured repeated instances of a sample. Bivariate linear regression predicts the effects of one variable on another or multiple variables, but it does not distinguish between independent and dependent variables (Green & Salkind, 2017; Ivashchenko, Khudolii, Yermakova, Iermakov, Nosko, & Nosko, 2016). Bivariate linear regression analysis was not appropriate for this study. I did not use the Pearson Product-Moment correlation coefficient because it assesses the relationships among three or more quantitative variables to determine if the variables are linearly related in a population

(Dorestani, & Aliabadi, 2017; Giroldini, Pederzoli, Bilucaglia, Melloni, & Tressoldi, 2016; Sher, Bemis, Liccardi, & Chen, 2017). Researchers use discriminant analysis to predict membership in two or more mutually exclusive groups and is appropriate for testing two categories of variables, and factor analysis helps with identifying the small number of factors that explain the major variance in a larger number of variables (Green & Salkind, 2017). In this study, neither discriminant analysis nor factor analysis were suitable analytical techniques. Multiple regression analysis was appropriate for this study because I examined the relationships between two independent variables and one dependent variable.

The data cleaning process is an important aspect of ensuring data quality in quantitative studies. Researchers use data cleaning to examine the collected information for missing, incomplete, or invalid information in the dataset before commencing the data analysis process (Kupzyk & Cohen, 2015; Leopold, Bryan, Pennington, & Willcutt, 2015). Dorazio (2016) noted that the data cleaning process required an in-depth examination of the collected information to identify and address data errors, remove outliers, and revalidate the accuracy of the required sample size to ensure accuracy in the data analysis process. After the survey closes, I examined the data collected to screen for errors such as missing information, invalid information, and incomplete information. I also examined the data for outliers, eligibility of participants, and accuracy of the sample size following the data cleaning process. I discarded invalid data from the analysis process. Researchers purported that invalid data creates uncertainty and unreliability in the data analysis process resulting in either inconclusive or unjustified findings (Cai &

Zhu, 2015; John-Akinola & Nic Gabhainn, 2015). If the required sample size for the study was not achieved following the data cleaning process, I would have redistributed the survey for 7 calendar days or until the appropriate sample size was received within the 30-day period.

In quantitative studies, researchers assume that there will be missing data from web-based survey instruments. Missing data occurs when participants fail to complete the survey in its entirety which can have a negative impact on data interpretation and findings (Cai & Zhu, 2015; Dorazio, 2016; John-Akinola & Nic Gabhainn, 2015). According to Bryman (2016), respondents may exclude a question deliberately, forget to answer the question, or do not know the answer to the question. In this study, I leveraged the SPSS statistical software to compute inconsistencies with the data and employ regression imputation to replace missing data with substitute values where there are at least two missing responses as per researchers' recommendations (Eekhout, van de Wiel, & Heymans, 2017; Kupzyk & Cohen, 2015; Moslehpour et al., 2018).

Multiple regression analysis has assumptions of normality, multicollinearity, linearity, homoscedasticity, and outliers (Bryman, 2016; Green & Salkind, 2017; Bryman, 2016; Saunders et al., 2015). Normality is important for researchers to decide the measures of central tendency (Mishra et al., 2019). In a normal distribution analysis, the variables are displayed on a bell curve, and a violation of normality indicates that the sample size is too small (Green & Salkind, 2017; Schmidt & Finan, 2018) or the incorrect model is selected to determine the true significance level (Yalcinkaya, Cankaya, Altindga, & Tuac, 2017). Researchers apply the skewness-kurtosis method to test for

normality in a dataset (Psaradakis & Vavra, 2018; Schmidt & Finan, 2018) but Curran-Everette (2017) suggested that bootstrapping is the best method to assess normality because it highlights the theoretical distribution of the sample statistics which concerns researchers more so than the distribution of observations. In this study, I used the bootstrapping technique to test for normality.

Multicollinearity refers to the degree of correlation between two or more variables (Bryman, 2016; Green & Salkind, 2017; Saunders et al., 2015). The assumption is that multicollinearity decreases when the sample size increases (Yu, Jiang, & Land, 2015). Researchers use the variation influence factor (VIF) between 5 and 10 to address issues with multicollinearity (Yu et al., 2015) I employed the VIF technique in the data analysis for this study. Linearity indicates the degree of change of the dependent variable on the independent variables (Bryman, 2016; Saunders et al., 2015). Researchers use linearity to determine if a straight-line relationship between variables exists by inspecting residual plots (Austin & Steyerberg, 2015; Pandis, 2015). Homoscedasticity represents the equality in variances between dependent and independent variables (Chang, Pal, & Lin, 2017). Researchers test for homoscedasticity by visual examination of the normal probability plot (P-P) of the standard residuals or the Levene test (Jupiter 2017). Outliers are data which appear to be significantly higher or lower than the remainder of the data set and are identified by examination of the data using scatterplots (Green & Salkind, 2017; Jeong & Jung, 2016).

In quantitative research, multiple regression analysis is used to examine the relationship between at least two predictor variables and one dependent variable (Hanley,

2016; Ramavhona & Mokwena, 2017). Green and Salkind, 2017 found that testing for assumptions of normality, multicollinearity linearity, homoscedasticity, and outliers in a data set validates the statistical analysis of the relationships among the variables. Green and Salkind's approach was supported by other quantitative researchers who adopted multiple regression analysis in their studies (Ching-Kang et al., 2017; Khan & Zubaidy, 2017; Pina-Monarrez et al., 2015). In this study, I used the scatter plot in SPSS statistical software to evaluate the assumptions of multicollinearity, outliers, normality, linearity, and homoscedasticity. I examined multicollinearity by viewing the correlation coefficients among the predictor variables. I further evaluated outliers, normality, linearity, and homoscedasticity by examining the normal probability plot (P-P) of the regression standardized residual and the scatterplot of the standardized residuals.

Violations of assumptions might occur during the data analysis process, which could negatively impact the reliability of the results and the researchers' conclusions about the problem. To address violations of assumptions, researchers can remove contributing observation values, determine the square root of an observation value by using non-linear transformation, develop a new composite observation value, or employ bootstrapping (Gerdin et al., (2016). In this study, I used the bootstrapping method to identify if there were significant violations to the assumptions. Bootstrapping is a non-parametric test used in regression analysis to randomly select samples data to predict reliability (Arya, 2016; Sanchez-Torres et al., 2016). I employed between 1,500 to 2,000 bootstrapping samples to combat any possible influence of assumption violations and 95% confidence intervals. Salimon et al. (2016) and Baubeng-Andoh conducted

bootstrapping analysis in their studies on customer adoption of e-banking services of 500 and 5,000 respectively.

Researchers use descriptive and inferential statistics to analyze, present, and interpret data (Bryman, 2016; Green & Salkind, 2017). In this study, I used SPSS to conduct descriptive statistics. I analyzed the probability (*p*-value) of .05 and used the medium size effect (f^2 =.15) to present descriptive and discussed inferential statistic results on the relationship between the independent variables: PU, PEOU, and the dependent variable: customer adoption of e-banking in Barbados. I used the *F*-test to determine the beta coefficients for the independent and dependent variables and their R^2 values. I interpreted statistical significance by the coefficient R^2 which should be less than .05 to be statistically significant. I presented the mean (*M*), standard deviation (*SD*), and bootstrapped results with a 95% confidence interval (CI) (*M*) for the number of valid participants (*N*) for the variables in a tabular form. I used standard multiple linear regression, α = .05 (two-tailed) to examine the efficacy of PU and PEOU in predicting customer adoption of e-banking in Barbados. I accepted the null hypothesis and rejected the alternative hypothesis if the results from the power analysis depict that R^2 is statistically greater than .05, indicating that there was no significant relationship between variables.

Saunders et al. (2015) noted that the different types of scales of measurements influenced the presentation, summary, and analysis of researchers' data. Therefore, to ensure accuracy of statistical analyses, researchers recommended the use of statistical software such as Excel, Minitab, SAS, Statview, or IBM SPSS Statistics to input,

categorize, and analyze data (Bryman, 2016; Saunders et al., 2015). I used IBM's SPSS

Statistics 24.0 software as the analytical tool for quantitative research. Krasiukova (2017)

found that SPSS was the appropriate statistical package to produce descriptive analyses

(mean, median, mode, standard deviation, skewness, and kurtosis) and inferential

statistical analyses (*T*-tests, *F-tests,* two-tailed, two-sided) of parametric and non-

parametric tests in quantitative research. Researchers consider SPSS as a friendly and

powerful statistical tool to employ in quantitative studies (Aadnanes et al., 2018;

Moslehpour et al., 2018). In prior studies on e-banking, researchers used SPSS statistical

software to examine the relationship between independent variables and customer

adoption of e-banking (Bambore & Singla, 2017; Ramavhona & Mokwena, 2017). SPSS

statistical software was, therefore, appropriate for this study for statistical analysis,

interpretation, and data management.

Study Validity

In quantitative business research, reliability focuses on replication and

consistency, while validity is concerned with the accuracy of data analysis, appropriate

data techniques or measures, as well as generalization of findings (Heale, & Twycross,

2015; Moslehpour et al., 2018; Saunders et al., 2015; Zyphur & Pierides, 2017).

Researchers stated that both reliability and validity are subjected to internal and external

threats (Saunders et al., 2015). Peers and academics could question the reliability and

validity in studies if there are inconsistencies in the data analyses (Heale, & Twycross,

2015; Saunders et al., 2015; Yin, 2018; Zyphur & Pierides, 2017). Researchers use the

Cronbach's alpha technique to validate the reliability of an instrument (George & Kumar,

2015; Ling et al., 2016; Mansour, 2016; Shaw & Sergueeva, 2019). I used the validated

TAM questionnaire with a Cronbach alpha of .97 for PU and .93 for PEOU (Davis, 1989)

to minimize threats to reliability in this study.

Internal validity measures the outcome of causal relationships in experimental and

quasi-experimental research. Threats to internal validity affect researchers' interpretation

of causal relationships among variables which can lead to inconclusive findings (Bleske-

Rechek et al., 2015; Heale, & Twycross, 2015). This research study was nonexperimental

and did not require manipulation of variables to determine a cause and effects of the

relationship. Therefore, addressing threats to internal validity was not be relevant.

External validity refers to generalization of the findings from sampling the

population (Moslehpour et al., 2018). Threats to external validity occur when researchers

fail to employ the appropriate sampling technique to align with the research question or

select the incorrect sample size for data collection and analysis (Pye, Taylor, Clay-

Williams, & Braithwaite, 2016). In this study, the sampling technique and representative

sample, therefore, reflected the nature of the correlational study. Following researchers'

recommendation, I used convenience sampling to allow participants equal opportunity to

participate in the study (Fricker, 2016; Shareef et al., 2018) and selected the

representative sample size by conducting an *a priori* G*Power analysis to ensure I

addressed threats to the selection validity process. While I addressed the threats to

reliability, internal, and external validity in this study, there might be threats to statistical

conclusion validity.

Researchers use statistical conclusion when attempting to determine the association of variables (Cunningham & Baumeister, 2016; Gasevic et al., 2016; Mujinga, Eloff, & Kroeze, 2018). Threats to statistical conclusion relate to potential errors researcher make when analyzing and interpreting data because of the application of inadequate statistical power (Cunningham & Baumeister, 2016; Sehgal & Chawla, 2017; Mujinga et al., 2018). A Type I error occurs with the identification of a non-existent relationship and inaccurately rejecting the null hypothesis and a Type II error identifies the inverse findings of a Type I error resulting in researchers' incorrectly assessing the outcome of the findings (Leppink et al., 2016; Li & Mei, 2016). Field (2013) recommended that researchers use a statistical power of .80 or higher and a construct reliability coefficient of at least.70 to address Type I errors. In this study, I minimized the threats to statistical conclusion by adopting a statistical power designation of .99 to develop the appropriate sample size to test the independent and dependent variables. Kennedy (2015) stated that post hoc analysis minimizes the threat to statistical conclusion validity. Therefore, I conducted a post hoc analysis to confirm the sample size reduces the threat of Type I errors.

Transition and Summary

In section 2 of this quantitative correlational study, I restated the purpose statement. I presented a comprehensive summary of the role of the researcher in the data collection process, eligibility of the study participants, and how I gained access to them. I discussed why I selected a quantitative correlational method and design for the study instead of other methodologies, how I identified the population that aligned with the

research question and justified why I selected a sample size of 68 and 146 participants. Section 2 also contained evidence on how I adhered to IRB's ethical guidelines and procedures for engaging human beings in research studies. I also presented a detailed discussion on the data collection instrument, the data collection technique, and the data analysis process. Section 2 concluded with a discussion on the reliability of the survey instrument and how I addressed any threats to statistical conclusion validity. Section 3 covered a detailed summary on the presentation of findings, application to professional practice, and the implications for social change. I concluded section 3 with recommendations for action, recommendations for further research on customer adoption of e-banking, and overall reflections of the study.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this quantitative correlational study was to examine the relationship between PU, PEOU, and customer adoption of e-banking services in Barbados. The predictor variables were PU and PEOU. The dependent variable was customer adoption of e-banking services. In this section, I presented the findings of the study, discussed the applicability of the findings to the professional practice of business, and the implications for social change. I also provided recommendations for action and further research on the study's topic.

The results from a multiple regression analysis indicated that there was a statistically significant relationship between PU, PEOU, and customer adoption of e-banking services. The model as a whole was able to significantly predict customer adoption of e-banking services, $F(2, 69) = 123.503$, $p < .001$, $R^2 = .782$, Adjusted $R^2 = .775$. The R^2 (.782) value indicated that approximately 8% of variations in customer adoption of e-banking services are accounted for by the linear combination of the predictor variables (PU and PEOU). PU and PEOU were statistically significant with PEOU ($t = 6.249$, $p < .01$, $\beta = .574$) accounting for a higher contribution to the model than PU ($t = 3.883$, $p < .01$, $\beta = .357$). Assumptions surrounding multiple regression were assessed with no serious violations noted. The conclusion from this analysis was that PU and PEOU were significantly associated with customer adoption of e-banking services.

Presentation of the Findings

In this quantitative correlation study, I examined the relationship between PU, PEOU, and customer adoption of e-banking services in Barbados. The research question was:

RQ: What is the relationship between PU, PEOU, and customer adoption of electronic banking in Barbados?

The null and alternative hypotheses were:

H_0: There is no statistically significant relationship between PU, PEOU, and customers' adoption of e-banking services.

H_1: There is a statistically significant relationship between PU, PEOU, and customers' adoption of e-banking services.

To answer the research question, I collected data for the variables using SurveyMonkey. After I obtained the IRB's approval, I distributed the invitation to participate in the study to eligible participants and embedded the link for the survey in the letter. I used Twitter, LinkedIn, and Facebook social networks to target participants for the study. Prior to completing the survey, participants were required to read and accept the conditions outlined in the consent form. The projected time to complete the survey was approximately 10 minutes, but the average time recorded by SurveyMonkey was 3 minutes. The survey remained opened for 2 weeks, however, on Day 8, I sent reminders to participants to complete the survey and distributed new invitation requests to increase the rate of participation. In total, I received 73 completed surveys. One record was discarded due to missing data, resulting in 72 records for the analysis. I closed the survey

after 2 weeks because I exceeded the minimum criteria of 68 participants to conduct data

analysis as per the priori power analysis using G*Power statistical software (Faul et al.,

2009). I conducted a posthoc analysis on the dependent variable customer adoption of e-

banking services to confirm that the sample size reduced the threat of Type 1 errors as per

researcher's recommendations (see Kennedy, 2015). I used a power of .93 to produce a

sample of 72. Table 1 shows the results from the posthoc power analysis of the dependent

variable using an effect size of 0.15 based on a correlation coefficient for customer

adoption of e-banking services of .917.

Table 1

Posthoc Analysis for Customer Adoption of E-Banking

Parameters	Value
Input Parameters	
Effect size	0.15
α err prob	0.15
Power (1- β err prob)	0.93
Number of predictors	2
Output Parameters	
Noncentrality parameterλ	10.80
Critical F	1.9502497
Numerator df	2
Denominator df	69
Total sample size	72
Actual power	0.9326963

Demographic Statistics

The demographic profile of participants showed that the population was mature and well educated. Of the 44.4% (32) male and 55.6% (40) female respondents, 72.2% were over the age of 35 with 97.2% having completed tertiary education. Table 2 displayed the 72 participants by age.

Table 2

Demographic Statistics by Age

Age	Number of Responses	Responses %
18 - 24	10	13.9%
25 – 34	10	13.9%
35 - 44	19	26.4%
45 - 54	23	31.9%
55+	10	13.9%
Total	72	100%

Reliability and Validity Test

Davis (1989) validated the TAM survey with a Cronbach alpha of .97 for PU and .93 for PEOU. Subsequent researchers performed reliability and validity tests on the TAM instrument and produced a Cronbach alpha between .70 to .90 (Ong et al., 2013; Radnan & Purba, 2016; Rostami, Sharif, Zarshenas, Ebadi, & Farbood, 2018). Ganciu, Neghina, Manescu, Simion, and Militaru, (2019) conducted a TAM study on customer intention to adopt internet banking in Romania and produced a Cronbach alpha of .744.

Rahi et al. (2017) in their TAM study on customer use of mobile banking in Saudi Arabia and produced Cronbach alpha reliability for PU of .82 and PEOU of .86. In this study, I adopted the validated TAM survey and did not test for reliability or validity of the instrument but relied on the results of previous validated studies. I used multiple regression analysis to test the assumptions, present descriptive statistics, and present inferential statistic results. Then, I provided a concise summary and concluded with a theoretical conversation pertaining to the findings. I employed bootstrapping, using 2,000 samples, to address the possible influence of assumption violations. Thus, bootstrapping 95% confidence intervals are presented where appropriate.

Tests of Assumptions

The assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals were evaluated. Bootstrapping, using 2,000 samples, enabled combating the influence of assumption violations.

Multicollinearity. Multicollinearity exists when there is a significant correlation between two or more variable (Bagya-Lakshmi, Gallo, & Srinivasan, 2018; Kim, 2019; Nguyen & Ng, 2020). Researchers use the VIF between five to 10 to address issue with multicollinearity (Yu et al., 2015). In this study, I calculated VIF of the independent variables and found that all values were less than five; therefore, the violation of the assumption of multicollinearity was not evident. Table 3 highlights that there were no conflicts between the predictor variables PU and PEOU.

Table 3

Correlation Coefficient Among Study Predictor Variables

Variable	Tolerance	VIF
PU	.374	2.671
PEOU	.374	2.671

Note. N = 72.

Outliers, normality, linearity, homoscedasticity, and independence of residuals. Outliers, normality, linearity, homoscedasticity, and independence of residuals were evaluated by examining the Normal Probability Plot (P-P) of the Regression Standardized Residual (Figure 2) and the scatterplot of the standardized residuals (Figure 3). The examinations indicated there were no major violations of these assumptions. The tendency of the points to lie in a reasonably straight line (Figure 2), diagonal from the bottom left to the top right, provides supportive evidence the assumption of normality was not violated. The lack of a clear or systematic pattern in the scatterplot of the standardized residuals (Figure 3) supports the tenability of the assumptions being met. However, 2,000 bootstrapping samples were computed to combat any possible influence of assumption violations and 95% confidence intervals based upon the bootstrap samples are reported where appropriate.
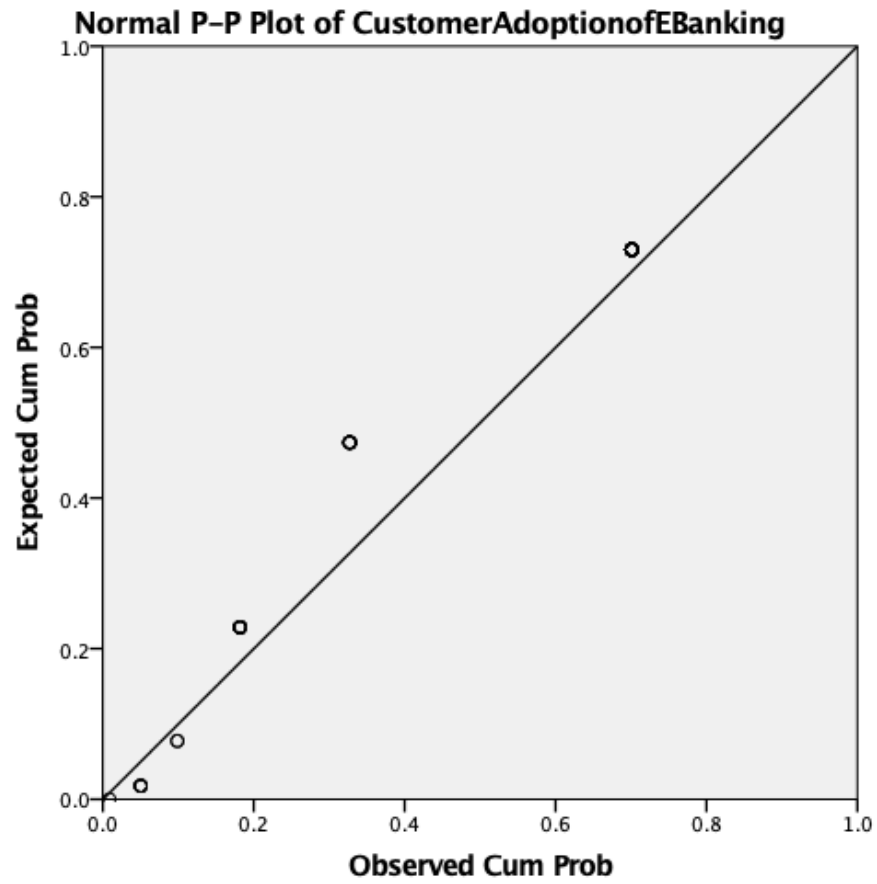
Figure 2. Normal probability plot (P-P) of the regression standardized residuals.
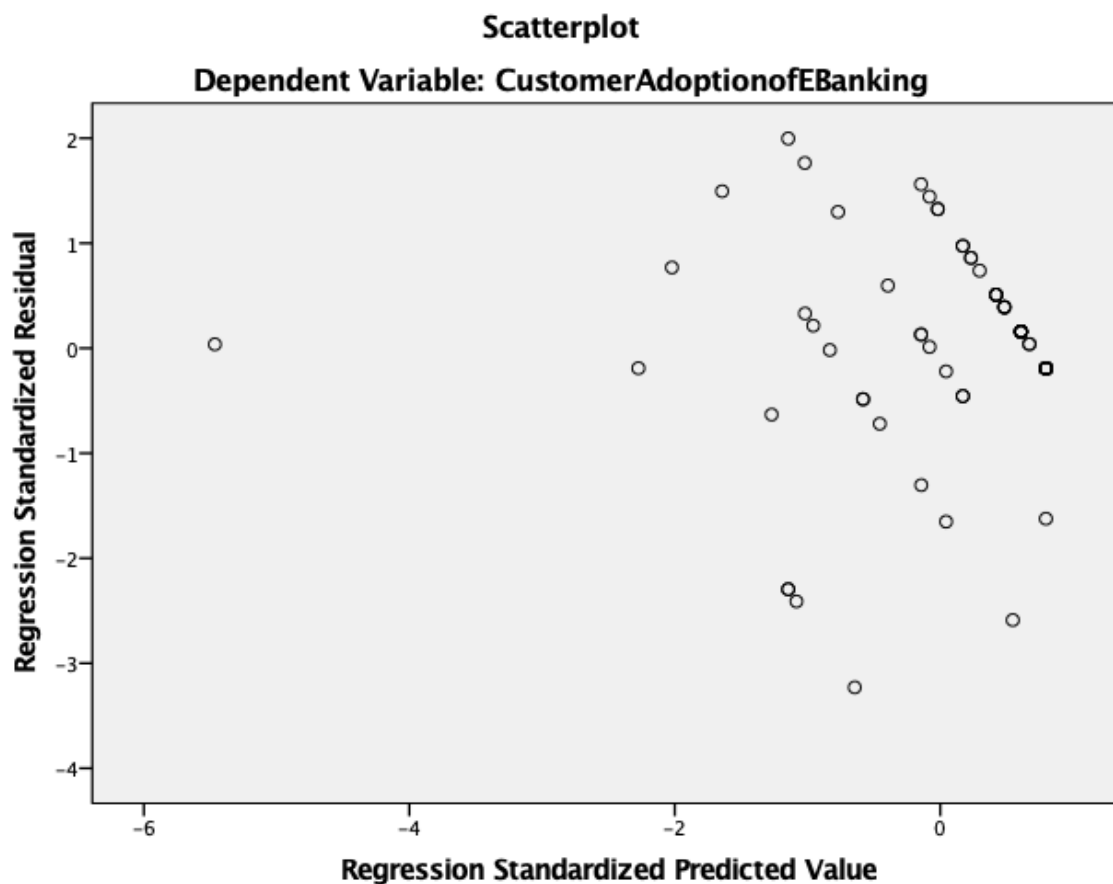
Figure 3. Scatterplot of the standardized residuals.

Descriptive Statistics

A total of 72 individuals participated in the study. The assumptions of outliers, multicollinearity, normality, linearity, homoscedasticity, and independence of residuals were evaluated with no significant violations noted. Table 4 depicts descriptive statistics for the study variables. Figure 3 depicts a scatter plot of the bivariate correlation, indicative of a positive linear relationship between PU, PEOU, and customer adoption of e-banking services.

Table 4

Means and Standard Deviations for Study Variables

Variable	M	SD	Bootstrapped 95% CI (M)[1]
Customer adoption of e-banking services	9.10	1.47	[8.72, 9.42]
Perceived usefulness	23.08	3.23	[22.22, 23.72]
Perceived ease of use	22.04	3.45	[21.15, 22.75]

Note: $N = 72$.

Inferential Results

Standard multiple linear regression, $\alpha = .05$ (two-tailed), was used to examine the efficacy of PU and PEOU in predicting customer adoption of e-banking services. The independent variables were PU and PEOU. The dependent variable was customer adoption of e-banking services. The null hypothesis was that there is no statistically significant relationship between PU, PEOU, and customer adoption of e-banking services. The alternative hypothesis was that there is a statistically significant relationship between PU, PEOU, and customer adoption of e-banking services. Preliminary analyses were conducted to assess whether the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals were met; no major violations were noted. The model as a whole was able to significantly predict customer adoption of e-banking services: $F(2, 69) = 123.503$, $p < .001$, $R^2 = .782$. The R^2 (.782) value indicated that approximately 8% of variations in customer adoption of e-banking services are accounted for by the linear combination of the predictor variables (PU and PEOU). In the final model, PU and PEOU were statistically significant with PEOU ($t =$

6.249, $p < .01$, $\beta = .574$) accounting for a higher contribution to the model than PU ($t =$ 3.883, $p < .01$, $\beta = .357$). The final predictive equation was:

Customer adoption of e-banking services = -.066 + .163(PU) - .245(PEOU)

Perceived usefulness. The positive slope for PU (.163) as a predictor of customer adoption of e-banking services indicated there was about a .163 increase in customer adoption of e-banking services for each 1-point decrease in PU. In other words, customer adoption of e-banking services tends to increase as PU decreases. The squared semipartial coefficient (sr^2) that estimated how much variance in customer adoption of e-banking services was uniquely predictable from PU was .22, indicating that 22% of the variance in customer adoption of e-banking services is uniquely accounted for by PU, when PEOU is controlled.

Perceived ease of use. The negative slope for PEOU (.245) as a predictor of customer adoption of e-banking services indicated there was a .245 decrease in customer adoption of e-banking services for each additional 1-unit increase in PEOU, controlling for PU. In other words, customer adoption of e-banking services tends to decrease as PEOU increases. The squared semipartial coefficient (sr^2) that estimated how much variance in customer adoption of e-banking services was uniquely predictable from PEOU was .35, indicating that 35% of the variance in customer adoption of e-banking services is uniquely accounted for by PEOU, when PU is controlled. The Table 5 depicts the regression summary.

Table 5

Regression Analysis Summary for Predictor Variables

Variable	*B*	*SE B*	*β*	*t*	*p*	*B* 95% Bootstrap CI
Perceived usefulness	.163	.042	.357	3.883	<.001	[.084, .316]
Perceived ease of use	.245	.039	.574	6.249	<.001	[.128, .334]

Note. *N*= 72.

Analysis summary. The purpose of this study was to examine the relationship between PU, PEOU and customer adoption of e-banking services in Barbados. I used standard multiple linear regression to assess the relationship between the independent and dependent variables. Assumptions surrounding multiple regression were assessed with no serious violations noted. The model as a whole was able to significantly predict customer adoption of e-banking services, $F(2, 69) = 123.503$, $p < .001$, $R^2 = .782$, Adjusted $R^2 = .775$. Both PU and PEOU provide useful predictive information about customer adoption of e-banking services. The conclusion from this analysis is that PU and PEOU are significantly associated with customer adoption of e-banking services.

Theoretical conversation on findings. Researchers use multiple regression to examine the relationship between multiple independent variables and one dependent variable (Alhamide et al., 2016; Mahmoudi et al., 2018; Green & Salkind, 2017). In this study, I used multiple regression analysis to determine if a linear relationship existed between PU, PEOU and customer adoption of e-banking services. I adopted Davis' (1986) TAM theoretical theory which formed the foundational framework for several

studies on customer adoption of e-banking over the past two decades (Danyali, 2018; Margaret & Njuguna, 2018; Normalini, 2019; Rahi et al., 2017).

In previous studies, TAM researchers concluded that there was a significant relationship between PU, PEOU, and customer adoption of e-banking services (Ganciu et al. 2019; George, 2018; Haider, Rahim, & Aslam, 2019; Normalini, 2018; Othman et al. 2019). Othman et al. conducted a study on customer behavior towards internet banking in Malaysia and found that there was a positive effect of PU, PEOU, and perceived credibility on customer intention to use internet banking. Likewise, Rahi et al. concluded that PU, PEOU, and attitude were key variables for customer adoption of internet banking in Pakistan. The findings of Vukovic, Pivac, and Kundid (2019), in their study on customer acceptance of internet banking in Croatia found that PU and PEOU had significant influence in customer acceptance of internet banking. Haider et al. supported other researchers' findings and identified PU and PEOU as significant variables that influenced online banking adoption in Pakistan. The findings of this study therefore are aligned with previous researchers' conclusions and I rejected the null hypothesis.

Applications to Professional Practice

Electronic banking in Barbados is in its infancy stages with modest rates of customer adoption despite retail bank leaders' efforts to increase e-banking adoption. The purpose of this study was to examine the relationship between PU, PEOU, and customer adoption of e-banking services in Barbados to provide information to help retail banking leaders understand customers' expectations and develop strategies to increase the rate of electronic banking adoption. The aim of the study was also to provide a model that could

potentially reduce high-cost over-the-counter transactions and increase profitability. The results from a sample of 72 complete responses showed that both PU and PEOU had a positive influence on customer adoption of e-banking services. Varma (2020) concluded that e-banking is the preferred banking solution for customers of the State Bank of India. Therefore, retail banking leaders in Barbados should use the results of this study to ensure customer adoption of e-banking is a focal pillar of their business strategy.

The results of this study indicate that customers perceived e-banking as a useful service which suggests that retail banking leaders could influence customer adoption if they develop strategies to increase the usage of e-banking. Patel and Patel (2018) purported that bank decision makers should encourage wider implementation and usage of internet banking. The findings also indicate that to improve customer adoption of e-banking, retail banking leaders must promote the convenience of performing banking activities at any time, from anywhere, and in a cost-efficient manner. Malaquias and Hwang (2019) argued that customers would realize timely access to their bank accounts with better information. Similarly, Nwekpa, Djobissie, Chukwuma, and Ezezue (2020) noted in their study on the influence of electronic banking on customer satisfaction in Nigeria that electronic banking helps customers to save time and money. Retail banking leaders could use the results from this study to migrate customers to e-banking services. Enhancing customer knowledge and insights on the usefulness of e-banking services is therefore critical to improving the adoption rate.

The results from the study showed that PEOU has a higher significance to customer adoption of e-banking than PU, which is an indication that customers perceived

e-banking easy to use, thus, increasing the likelihood that they will continue to use the systems. Retail banking leaders could influence customer adoption of e-banking by creating marketing strategies and advertising campaigns to raise customer awareness about the features, capabilities, and accessibility of e-banking. Marakarkandy et al., (2017) recommended that financiers focused on customizing marketing campaigns to attract target audiences for e-banking adoption. Retail banking leaders could also focus on strategies to enhance their existing e-banking platforms to increase customer usage and adoption. Improving the design, layout, and performance of the platforms, such as arrangement of menus and options could increase existing customer usage and new registrations (Liebana-Cabanillas et al., 2016). Additionally, Retail banking leaders could use the findings of this study to gain an understanding on how to create organizational structures to facilitate e-banking services thereby providing dedicated employee support to customers to ensure increase usage of the systems. Overall, the results of this study showed that PEOU is a significant factor in customer adoption of e-banking, therefore, retail banking leaders must continuously improve the components of e-banking to make it easy to use.

Implications for Social Change

The implications for social change include the potential for retail banking leaders to gain a better understanding of the factors that influence customer adoption of electronic banking services in Barbados and develop the appropriate strategies to increase usage. Retail banking leaders may also have better insights into the aspects of electronic banking that require improvements to provide Barbadian residents with an enhanced

banking experience. With an improved understanding, retail banking leaders could increase the awareness of the availability of electronic banking services to their customers in Barbados. Retail banking customers could have access to affordable financial services thereby increasing their disposable income to improve the economic conditions within their families and communities.

Electronic banking could be a key enabler for a country's go-green initiatives (Selvaraj & Ragesh, 2018). A practical implication for social change may include an increased usage of electronic banking services to stimulate the progression of Barbados into an environmentally friendly society with a reduction in the paper used to perform branch-based transactions. Retail leaders could use e-banking to promote the use of cashless transactions, online wire transfers, and electronic statements instead of traditional methods that generate paper. Bank leaders can in turn allocate additional funding from increased profits to government-initiated go-green campaigns as corporate social responsibilities' (CSR) sponsorships. Communities can benefit from increased donations from retail banks for social, educational, and economic programs to improve the socio-economic statuses of residents. The government of Barbados could use the results of this study to engage private sector entities in its environmental preservation projects.

Recommendations for Action

Despite the low e-banking rates in Barbados, the findings of this study demonstrated that customers perceive the e-banking to be useful and easy to use. The recommendations for retail banking leaders to increase the adoption of e-banking include

(a) improvement to the e-banking technology infrastructure, (b) development of marketing and promotional campaigns, (c) creation of customer educational programs, (d) implementation of organizational structures, and (e) revision of fees and pricing.

Retail banking leaders should ensure that the e-banking platform is reliable, available, and accessible for customer use. Patel & Patel (2018) found that incorporating customers' feedback was a measure for bank leaders to consistently implement e-banking system upgrades. To achieve this objective, a recommendation is that retail banking leaders allocate an annual budget to fund the maintenance and enhancement of e-banking platforms. The investment in technology infrastructure improvements would demonstrate bank leaders' commitment to periodically maintain and upgrade the websites to improve customers' experiences with e-banking (Chandio et al., 2017; Liebana-Cabanillas et al., 2016; Ramos et al., 2018).

A second recommendation is that retail banking leaders develop marketing and promotional campaigns to increase the customer awareness of the benefits of e-banking. Researchers recommended that bank leaders develop effective advertising campaigns and customer referrals programs to increase customer awareness of e-banking (Alhassany & Faisal, 2018; Alkailani, 2016; Patel & Patel, 2018). The banks' marketing managers could use social media networks, traditional media, and in-branch methods to advertise e-banking features, benefits, and registration processes. Additionally, retail banking leaders can offer incentives to existing users to promote e-banking to new prospects as per researchers' recommendations (Gupta, 2018; Patel & Patel, 2018).

Customer education on the benefits of e-banking is critical to successful adoption (Putra, Suprapti, Yasa, & Sukaatmadja, 2019). A third recommendation, therefore, is that the retail banking leaders educate their customers about the benefits of e-banking. Putra et al. recommended that bank leaders erect a banner about the benefits of e-banking at their office locations. Additional strategies include establishing educational videos, training tips, and frequently asked questions (FAQs) on the e-banking platforms to help customers become self-sufficient with the applications. The educational material could include tips on self-registration, password changes, use of features, and security protocols (Malaquias & Hwang, 2019). The bank's web development team would be responsible to ensure the online platforms are frequently updated with the appropriate educational material for customer usage.

Another recommendation is that retail banking leaders can implement organizational structures to support e-banking services quality. Singh, Kulshrestha, and Rohini (2020) found that service quality influenced customer adoption of e-banking. The creation of dedicated teams to support e-banking can help increase customer adoption of e-banking services. The service team would perform demonstrations of e-banking; and respond to customer queries either via the telephone, email, chat box, or social media networks. Each team would be equipped with training and procedures to resolve system-related issues or customer queries, thus ensuring retention of existing customer and conversion of new users (Danyali, 2018; George & Kumar, 2015; Gupta, 2018; Padmaja et al., 2017). Retail banking leaders could project annual performance targets for e-

banking conversion and introduce employee rewards and recognition incentives to encourage participation.

The final recommendation is that retail banking leaders use the results of this study to generate increased revenue by revising their product pricing strategy. To reduce the overhead costs of OTC transactions, the bank's leaders can increase the fees for OTC services and offer the same services at a lower cost or free of charge via e-banking channels (George, 2018; Gupta, 2018). This diversion tactics would make in-branch banking costly and unattractive to the customer who would opt for e-banking services. The caveat to this recommendation is that bank leaders should develop an effective customer communication plan to avoid customer attrition or migration to the competition.

The findings and recommendations of this study may be relevant to leaders in other financial institutions, such as credit union, investment banks, and corporate or wholesale banking who use or plan to introduce e-banking services. The study is also applicable to website or mobile banking developers and marketing professionals who design and promote the usefulness and use of e-banking. Regulators and government agencies could use the findings and recommendations of this study to help implement guidelines to monitor e-banking products and promote a paper-less environment respectively. I plan to disseminate the results of this study at conferences and seminars on innovation technology or electronic banking in Barbados and the Caribbean region. I also intend to publish my research in peer-reviewed journals such as the *International Journal of Bank Marketing, Journal of Enterprise Information Management, Information Systems*

& E-Business Management, and *Review of International Business and Strategy.* My study will also be accessible via the ProQuest/UMI dissertation database.

Recommendations for Further Research

There were four limitations of this study. The first limitation was that participants could withdraw from the survey at any time, therefore; the valid responses may not be a representation of the population. Future researchers could include other survey design methods such as email distribution or engagement of survey companies to publish the questionnaire to increase the level of participation. Increasing the sample size would improve the likelihood of researchers achieving the valid response criteria for data analysis.

The second limitation was the use of the survey technique with closed-ended responses of participants. In future studies, I recommend that researchers modify the TAM survey instrument to capture participants' comments. Alternatively, researchers could adopt a mixed-method approach which has a qualitative component to capture the participants' opinions and feedback through semi-formal interviews. Including a qualitative design could strengthen the data collection process by capturing participants' opinions and lived experiences with open-ended questions.

The third limitation of the study was the focus on retail banking customers in Barbados that might not have represented the views of electronic banking customers in other customer groups, financial institutions, or countries within the Caribbean region. A recommendation for future researchers would be to include customers the corporate and private banking sectors to examine the factors that influence customer adoption of e-

banking on a diverse customer base to improve generalization of the results. Additionally, future researchers could replicate this survey for customers of credit unions and insurance companies that have also embarked on electronic payments solutions. The impact of customer adoption of e-banking could also be a topic for future research in other Caribbean countries to determine if the results of this study are comparable.

Lastly, this study might become irrelevant due to technology advances in electronic banking in response to environmental factors or increased customer demands. Future research should therefore include new validated theories as foundation frameworks. Likewise, researchers can include other variables such as trust, self-efficacy, perceived risk, social influence, and cyber security as factors affecting customer adoption of e-banking. Despite the limitations of the study, the findings are significant to potentially improve retail banking leaders' understanding of the factors that affect customer adoption of e-banking and initiate a call to action.

Reflections

The Walden DBA program was a challenging yet rewarding experience. As a result of the program I transformed my academic skills, professional development, and social awareness from being a product of an environment with a high standard of teaching and learning. I was inspired to complete my doctoral research study on innovation technology early in my DBA journey. After in-depth research on the emergence of electronic banking in developed and developing countries, examining the factors affecting customer adoption of e-banking in Barbados became my topic of interest.

I conducted a quantitative study to expand my knowledge of the methodology, applicable designs, and statistical analysis using SPSS statistical software. I may also use the TAM theory as a benchmark framework for future research. As a banker, I have a keen interest in understanding customer intrinsic and extrinsic motivations, therefore, ensuring that I managed personal biases or preconceived ideas throughout the DBA study was critical to producing objective conclusions. As a student of Walden, I have a greater appreciation to be a catalyst for positive social change within my country and the region.

I have a sense of accomplishment to know that the findings of this study will be sources of reference for independent scholars and educators as they pursue future studies in e-banking services. It will also be a model to potentially help practitioners develop business strategies to advance the adoption of e-banking. Overall, the DBA program has empowered me to publish future research in peer-reviewed journals and contribute to extant literature.

Conclusion

Retail banks are symbolic of economic growth and stability in Barbados. To gain and sustain competitive advantage, retail banking leaders implemented electronic banking to increase profitability by the reducing overhead costs associated with branch-based transactions. However, the rate of customer adoption of e-banking remained low. In this quantitative correlational study, I examined the statistical relationship between PU, PEOU, and customer adoption of e-banking. I adopted the TAM framework and validated TAM survey instrument to collect primary data using SurveyMonkey. I used SPSS statistical software to perform multiple regression analysis on 72 valid responses and

found that both PU and PEOU were statistically significant factors that influenced

customer adoption of e-banking. The results therefore supported the null hypothesis.

Retail banking leaders could use the results of this study to develop strategies

increase customer awareness of the usefulness and user-friendliness of e-banking through

increased marketing campaigns, educational materials, and incentive programs. Likewise,

retail banking leaders can advertise the benefits of e-banking by promoting it as a

convenient and affordable alternative to traditional banking. Other financiers, regulators,

and technology innovators could use the results of this study to increase customer

adoption of e-banking in Barbados and the Caribbean region. The four limitations of this

study are fundamental for future researchers to examine the factors that influence

customer adoption of e-banking and contribute to business practice, social change, and

extant literature. Despite the limitations, this study could be a source for retail banking

leaders to use to increase e-banking adoption, profitability, and contribute to the

economic growth of Barbados.

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Appendix A: Survey E-Banking Adoption

Please select the option that applies to you:					
Section 1 - Demographics					
What is your gender	Male	Female			
What is your age range	18 - 24	25 - 34	35 - 44	45 - 54	55+
What is your education level	High school certificate	College diploma	Bachelor's degree	Masters' degree or higher	
What is your monthly income (USD)	$0 - 4999	5000 - 9999	10,000 - 14,999	15,000 - 19,999	20,000+
Do you own a mobile device or computer (select all that apply)	Smartphone	Tablet	Laptop	Desktop computer	
How long have you been living in Barbados (years)	1	2	3	4	5+
Please select the option that applies to you:					
Section 2 - Perceived Usefulness					
	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Using e-banking enables me to complete my banking activities more quickly.					

Using e-banking improves my banking experience					
Using e-banking helps me to complete my banking activities conveniently					
Using e-Banking helps me manage my banking activities more efficiently					
I find using e-banking useful for managing my banking activities					
Overall, I find using e-banking more advantageous than in-branch banking					
Please select the option that applies to you:					
Section 3 - Perceived Ease of Use					
I think learning how to operate e-banking is easy					
I find it easy to use e-banking for my banking activities					
My interaction with e-banking is clear and understandable					
I find e-banking to be flexible to interact with					
It would easy for me to become skillful at using e-banking					
I find e-banking easy to use					

Appendix B: Permission to Adopt TAM Survey Instrument

MIS Quarterly

MIS Quarterly
Carlson School of Management
University of Minnesota
Suite 4-339 CSOM
321 19th Avenue South
Minneapolis, MN

January 16th, 2020

Jacqueline Bend Walden University

DBA Candidate

Permission to use material from
MIS Quarterly in Dissertation
Dissertation Title: *Factors Affecting Electronic Banking Adoption in Barbados*

Permission is hereby granted to Jacqueline Bend to reprint the information outlined in detail below – Questionnaire (and supporting material as necessary).

Questionnaire
Title: Perceived usefulness, perceived ease of use, and user acceptance of technology
Authors: Davis F.D.
Publish Date: September 1989
Journal: MIS Quarterly
Content requesting permission for: questionnaire
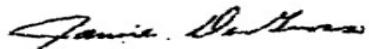Journal volume: 13
Issue: 3
Page: 340

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Sincerely,

Janice I. DeGross
Manager, MIS Quarterly