


# Evaluating Attractiveness and Perceived Risks: The Case of Green Banking Services in Bangladesh

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## ABSTRACT

Access to green banking services has the potential to improve and promote environmentally friendly practices in banking sector of Bangladesh. Beyond its usefulness for the environment, green banking also benefits the clients by offering new channels of financial services delivery in a convenient and quickly manner. While this is an attractive option, there are a number of perceived risks attached to it. This study aims to examine factors that can influence the attractiveness of green banking services, alongside explaining associated risks for its adoption in Bangladesh. Findings indicate that clients are mostly attracted to green banking services due to its social and task attractiveness. However, perceived risks like financial, time, individual, and cyber risks often hamper this attractiveness. Overall results confirm the relationship between perceived risk and attractiveness and their subsequent influence upon client's behavioral intention towards green banking services. Implications and future directions are discussed as well.

## KEYWORDS

Bangladesh, Behavioral Intention, Client's Perception, Environmentally Friendly, Green Banking Services, Perceived Attractiveness, Perceived Risk, Technology Adoption

## INTRODUCTION

Many emerging economies today promote environmental-friendly practices by implementing various forms of green banking services as part of the global initiative to protect environment. Through investing in different pollutant industries, financial institutions indirectly contribute to environmental pollution. Subsequently, green banking services are now part of eco-friendly practices and in-house operations of the daily banking activities (The Daily Observer, May 26, 2015). Green banking mainly involves the environmental and social responsibility of banks through their in-house operations and the wide range of financial products and services that they offer towards ensuring sustainability of the environment and ecological system (Nisha, 2017). Beyond its usefulness for the environment,

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green banking also attracts the clients by offering new channels of financial services delivery (Iqbal et al., 2017). Global awareness about greenhouse effects and climate change gave rise to the notion of green banking in many developed countries and alongside, few developing countries also adopted the concept of “GO GREEN” (Singhal, 2014).

Following the footsteps, developing country for instance, Bangladesh has joined the bandwagon around 2011 (Masum, 2015). The central bank of Bangladesh formulated Green Banking Policy which aims to ensure environment-friendly business practices by banks and financial institutions by promoting sustainable financial and economic growth across the entire country (Rifat et al., 2016). The contribution of Bangladesh Bank to make green banking a reality in Bangladesh is a commendable move, as it is the only central bank in the South-Asian continent which has issued such an analytical guideline for the adoption of green banking (Hossain and Ahmed, 2015). The common green banking services that all banks offer in Bangladesh today includes the use of e-statements instead of printed statements or e-mails instead of paper documents, internet banking, SMS banking, mobile banking, the use of Automated Teller Machines (ATM), Bangladesh Automated Cheque Processing System (BACPS), Bangladesh Electronic Fund Transfer Network (BEFTN) or other mobile financial services in the form of e-currency like bKash, mCash, EasyCash etc. (Masukijjaman & Aktar, 2013). According to Bangladesh Bank, all these green banking services are necessary for the sustainability in the long-run. However, the application of green banking chiefly requires the involvement of the bank clients, since they are the ones who are at the forefront of using such initiatives to conduct their banking transactions. Bangladesh Bank has mandated the commercial banks to introduce rigorous programs in order to educate clients and influence them to comply with the environmental regulations as well as to undertake activities which are going to benefit the environment (Islam & Kamruzzaman, 2015).

The design and delivery of green banking financial services vastly depends on technology. This rapidly changing technology in the service delivery of the banking sector has profoundly changed the way customers today interact with their financial service providers (Sanakulov and Karjaluo, 2015). However, many clients may also be reluctant to adopt green banking services in a developing country due to a lack of trust in the security of online technology and concerns regarding the use of information submitted electronically. These security concerns are not without merit. In light of the inherent uncertainty of using an open technological infrastructure like Internet, clients want assurance that their online interaction with the bank is secure and reliable (Iqbal et al., 2018). Moreover, an increase in the use of wireless telecommunications like mobile phones and Internet-enabled Smartphone has also contributed to the change in customer behavior to a large extent in adopting green banking services (Nisha, 2017). The major objective behind this change is to attract more customers, improve customers' perceptions, and encourage loyalty towards alternative delivery channels such as green banking services. So, as much as attractive green banking services are for clients in Bangladesh, the perceived risks associated to such services can often impede this attractiveness. The most important aspect of this Green Banking Policy is actually directed towards the bank clients. Therefore, it is crucial to address the issues relating to customer attractiveness and risks regarding developing intention to use green banking by the customers.

A notable study by Weber et al. (1992) has examined perceived risk and attractiveness judgments, claiming that attractiveness and perceived risk are closely related yet tending to be distinct phenomena. Moreover, the findings of this study highlight a presumed relationship not only between these two factors, but of both these factors to the behavioral intention of choosing an alternative over the other. Although the researchers examine these connections in the context of lotteries, a similar concept can be applied to the context of adopting a technology for green banking. On this note, this study is going to address the following research questions:

- To what extent the facets of perceived risk can influence the adoption of green banking services among the bank clients of Bangladesh?

- To what extent the factors of attractiveness can influence the adoption of green banking services among the bank clients of Bangladesh?
- To what extent both perceived risk and attractiveness can influence the adoption of green banking services among the bank clients of Bangladesh?

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Risk and attractiveness are on two opposite sides of one continuum which affect our decision making process. While risk can be implied through uncertainties, attractiveness can be better categorized through appraisal. Before making any decision people commonly evaluate risk which mostly increases in new or unknown situations (Weegels and Kanis, 2000). Therefore, perceived risk is one of the most essential features that should be considered while evaluating a system or technologies or making financial decisions. Even with perceived risk being an overriding feature in decision-makings, there exists a relative fuzziness regarding the implication of this notion. For instance, perceived risk may carry different meanings for different people in different conditions. Webster's dictionary expresses perceived risk as the possibility of damage or loss. On the contrary, prior researchers like Nygren (1977) defined perceived risk as 'inverted' attractiveness.

Nonetheless, following the attractiveness theory, as presented by McCroskey and McCain (1974) and later, by McCroskey et al. (2006), attractiveness is actually said to originate from the effects of interpersonal attraction on the effectiveness of users' real-world interaction and communication. Conceptually, perceived risk is therefore said to be the determinants of attractiveness since the lower the perceived risk, the more favorable will be the attractiveness of a course of action (Ganzach, 2000). Theoretically attractiveness is a function of perceived risk, as the lower the perceived risk, the more promising is the attractiveness of a system (Ganzach, 2000). Symbolically, one could imagine a person looking at a system through rose-colored glasses while judging attractiveness but looking through grey-colored glasses while judging risk (Weber et al., 1992). Therefore, even after being closely related, attractiveness and perceived risk are considered as distinct phenomena. The current study has been planned to explore this supposed connection between judgments of attractiveness and perceived risk, as both these two concepts can sooner or later join to regulate the adoption intention for a system (Ganzach et al., 2008). In this paper, we have tried to inspect the notion- "higher the risk, lower the attractiveness and the less favorable will be a system"- in the context of judgements regarding the technology adoption of the Green Banking services by the citizens of Bangladesh.

The primary construct that has been explored in this paper is perceived risk. Since 1960s, perceived risk theory has been used to illuminate users' behavior (Lee, 2009). Previous researches like Thakur and Srivastava (2014), Sohail and Al-Jabri (2014), Weerakkody et al. (2015), Zhang and Zhang (2017), Khalilzadeh et al. (2017) and Iqbal et al. (2018) emphasized the role of perceived risk in the context of adoption intention of an electronic service. According to Peter and Ryan (1976) perceived risk is a kind of subjective expected loss. Whereas, Featherman and Pavlou (2003) define perceived risk as the possible loss occurring while a preferred outcome is chased. In the context of this research, perceived risk can be defined as fears related to probable undesirable consequences of using Green Banking services. Five different types of risks, namely performance risk, individual risk, financial risk, time risk and cyber risk have been identified in this paper based on past literature.

Performance risk can be defined as virus attacks, worms, Trojans, backdoors, and other malwares that can result in malfunctioning, data corruption or software failures – failing in delivering the desired performance of green banking services to the users. Therefore, users may often get fearful that a failure of system servers or interruption from the Internet may occur while using green banking services resulting in an unforeseen cost. Consequently, a negative relationship exists here (Herath et al., 2014 and Yang et al., 2015). Besides an early study by Nastase and Nastase (2007) and later, Iqbal et al. (2018) inspected the influence of individual risks on e-service adoption. This risk can be defined as the risk that emerges owing to human errors like careless data disposition and inaccurate

submissions by the user. This risk is further assumed to have a hostile consequence on the intention to use green banking services.

Another type of risk that has been acknowledged in this research is financial risk. This risk can be referred to the risk of possible financial loss owing to fraud or monetary outlay associated with the use of a technology (Lee, 2009). Through our study, we have expanded this aspect to take in the probability for financial loss due to fraud in green banking services, paving way to another seeming adverse relationship (Yang et al, 2015). Next type of risk that has been considered in this study is time risk. Time risk may refer to the loss of the time and inconvenience incurred in consequence of the difficulty of navigation due to disruption of internet connections, mobile networks or electricity line, website downtime or loss of server connections. Prior studies like Martins et al. (2014) and Mha (2015) provided indication in favor of the adverse impact that time risks may have over adoption intention of a technology. Lastly, the final aspect of risk anticipated in this research is cyber risk (security risk). Cyber risk can be defined as an individual's reluctance to accept green banking services owing to the possibility of being a prey of cybercrimes i.e. hacking, identity or password theft. Results of the studies by Mha (2015), Yang et al. (2015) and Cherdantseva (2016) indicate users' uneasiness for the theft of their private information. Thus, an inverse relationship can be expected in this scenario.

Additional latest literature with regard to risk also requires some discussion. For example, Gupta et al. (2017) reveal that perceived risk and control in terms of level of security influences Indian customers' intention to adopt mobile banking services significantly. Similarly, Hurbert et al. (2017) demonstrate that the financial risk, performance risk and security risk influence on the behavioral intention in the context of mobile shopping. Likewise, Al-Momani et al. (2016) developed a conceptual model of the adoption of "Internet of Things" (IoT) services and reports that the perceived risks such as cost, trust, security, privacy and IT knowledge influences the adoption intention significantly. Additionally, Shankar and Kumari (2016) explore that the perceived risks such as security, privacy, and financial have a positive impact on mobile banking (m-banking) adoption behavior of Indian consumers. Alawan et al. (2016) and Martins et al. (2014) further affirm that the perceived risks can have an influence on the behavioral intention of technology adoption. Since the five types of risk identified in this study have been considered as important facades of perceived risk in the literature, the following hypotheses are recommended:

**H1a:** Performance Risk has a significant influence on Perceived Risk.

**H1b:** Individual Risk has a significant influence on Perceived Risk.

**H1c:** Financial Risk has a significant influence on Perceived Risk.

**H1d:** Time Risk has a significant influence on Perceived Risk.

**H1e:** Cyber Risk has a significant influence on Perceived Risk.

Green consumers can be attracted to adopt green banking services as being part of green services. Theory of Planned Behaviour (TPB) can predict the behavioural intention of the environmentally conscious consumers. On this note, Yadav and Pathak (2017) followed TPB to illustrate that attitude, social norm and behavioural control influences Indian consumers' intention to buy green products. However, Taufique and Vaithianathan (2018) followed TPB on Indian young urban consumers to explore ecologically conscious consumer behaviour (ECCB). They report that attitudes and perceived consumer effectiveness both have a significant influence on ECCB. Likewise, Brochado et al. (2017) demonstrate a strong positive relationship between green activists and ecologically conscious consumer behaviour (ECCB). Hence, green consumers can influence the behavioural intention of green banking services.

The other factor that is similarly crucial in the context of technology adoption in green banking is attractiveness. According to Shen et al. (2017), the term attractiveness has been devised from interpersonal relationship theory. It refers to one's inclination to evaluate another person, a technology or a service positively. Users' behavioral choices are governed by the attractiveness of a technology

(Alsamydai, 2014). Through his study, Heijden (2003) established striking positive link between perceived attractiveness and usage intention by using an extension of the Technology Acceptance Model (TAM). Even so, this is a somewhat new and less discovered feature in technology acceptance studies. Consequently, the present study explores the effect of attractiveness on the adoption of green banking services. Three aspects of attractiveness-namely task, social, and physical- have been suggested in this study to examine adoption intention.

Task attractiveness refers to the attraction embedded in the capability green banking services in helping users to complete tasks (Shen et al., 2017). From the perspective of business productivity and efficiency, task attractiveness is an analytic tool for gauging the success of IT adoption (Kim et al., 2015). Following the routes showed by Chen and Shen (2015) and Pappas et al. (2017), we hence suggest that only when the capabilities of green banking services will match the task demands of users, the technology may have a positive effect on users' usage intention. On the contrary, social attraction or sociability refers to the ability of a green banking service to maintain users' social interaction. Sociability of a technology motivates users' association and engagement with a technology based service (Burucuoglu and Erdogan, 2016). According to Shen et al. (2017), social attractiveness is gaining more and more attention these days for green banking services, as it can assist the rise of social communication between users and green banking services providers in order to better avail the services. The next and final crucial feature of attractiveness framework is physical attractiveness. It can be defined as the extent to which physical traits of a technological service are viewed beautiful or attractive to influence usage. It can also refer to the simplicity or ease of use that users presume in navigating a portal. Li (2011) and Liang et al. (2011) claim that visual aesthetics like appealing colors, shapes, font types or music in websites can impact users' loyalty in technology-based services. Consequently, a resilient and positive relationship between physical attractiveness and usage intention can be assumed in this context.

Furthermore, some recent literature with respect to technology attractiveness also needs to be addressed. For example, Shen et al. (2017) demonstrate that the distinctive role of technology attractiveness, including task, social, and physical attractiveness influencing user acceptance of social commerce engagement. Similarly, Hurbert et al. (2017) report the ease of use and usefulness on the behavioral intention in the context of mobile shopping. Likewise, Alawan et al. (2016) reveal that the perceived usefulness and perceived ease of use influence Jordanian customers' intention to adopt mobile banking (MB). Moreover, Al-Momani et al. (2016) developed a conceptual model of the adoption of "Internet of Things" (IoT) services and reports that perceived ease of use and usefulness, social influence and trust influences the adoption intention significantly. Unlike usefulness, Shankar and Kumari (2016) explore that social influence has the least influence on mobile banking (m-banking) adoption behavior of Indian consumers. According to Kim et al. (2015), the fit between the technology and users' tasks affect RFID-driven task performance based on the extended Task-Technology Fit (TTF) model in Korea. In addition, performance expectancy, effort expectancy, and social influence are often reported to be the strongest predictor of behaviour intention and usage behaviour of Internet banking (Martins et al., 2014). Therefore, based on the idea that these three types of attractiveness are resilient aspects of perceived attractiveness for green banking services adoption, we therefore hypothesize:

**H2a:** Task Attractiveness has a significant influence on Attractiveness.

**H2b:** Social Attractiveness has a significant influence on Attractiveness.

**H2c:** Physical Attractiveness has a significant influence on Attractiveness.

It has been already stated in this study that perceived risks which significantly influence the attractiveness of a technology are the counterpart of a technology's attractiveness. Even though many researchers have already used perceived risk as a construct to predict consumers' usage intention of a technology based service in different contexts, perceived attractiveness is yet to be explored.

Several previous studies have time and again claimed that perceived risk has a negative influence on users' adoption intention of a technology. For instance, a study conducted by Mou & Cohen (2014) in the context of consumer acceptance of online health information services identify perceived risk as a significant inhibitor behind usage intention. Similarly, Al Khattab et al. (2015) and Xie et al. (2017) reveal that perceived risk has direct and significant negative influence on users' intention to adopt e-Government services. Kansal (2016) also studied the impact of perceived risk on consumers' intention to use self-service banking and indicates that perceived risk exert a strong influence. Biucky & Harandin (2017) further explore the variables that can influence users' behavioral intention to buy products via social networking and found perceived risk as a strong predictor. Recently another study by Humbani & Wiese (2018) recognized perceived risk as a significant influencer which effect users' intention to use mobile-payment services negatively. However, Liébana-Cabanillas et al. (2014) reject the idea that perceived risk and usage intention are negatively and significantly correlated in the context of users' acceptance of mobile payments.

Due to mixed empirical evidence in the area, we have attempted to predict consumers' intention to use green banking services based on an integrated risk-attractiveness model in this study. As perceived attractiveness has not been explored much previously in the context of technology acceptance, only limited literature is available on this variable. For instance, Heijden (2003) attempted to explore how aesthetics attractiveness of a website can affect consumers' usage intention. The researcher modified the original TAM model by including this new variable and found a positive impact on usage intention. Later, Sonderegger and Sauer (2010) claimed in their study that perceived attractiveness is one of the most significant variables that can affect the usability of technological services. On the other hand, Enér and Knutsbo (2015) investigated the impact of perceived attractiveness on the acceptance and usage intention of smartwatches and revealed that it is positively correlated with usage intention.

As claimed by Nygren (1977) and Weber (1992), perceived risk may enter into findings of attractiveness and can amend it. Hence, the objective of this study is to provide an improved understanding of green banking services adoption from the perspective of a new integrated risk-attractiveness framework by capturing all these multidimensional aspects of risk and attractiveness. Hence, we have used explicit questions in the current study to inspect how different green banking services are weighed by the interviewees concerning risks and attractiveness, as well as concerning usage. Hence, the following hypotheses are formulated:

**H3:** Perceived Risk negatively influences Attractiveness.

**H4:** Perceived Risk negatively influences Behavioral Intention.

**H5:** Attractiveness positively influences Behavioral Intention.

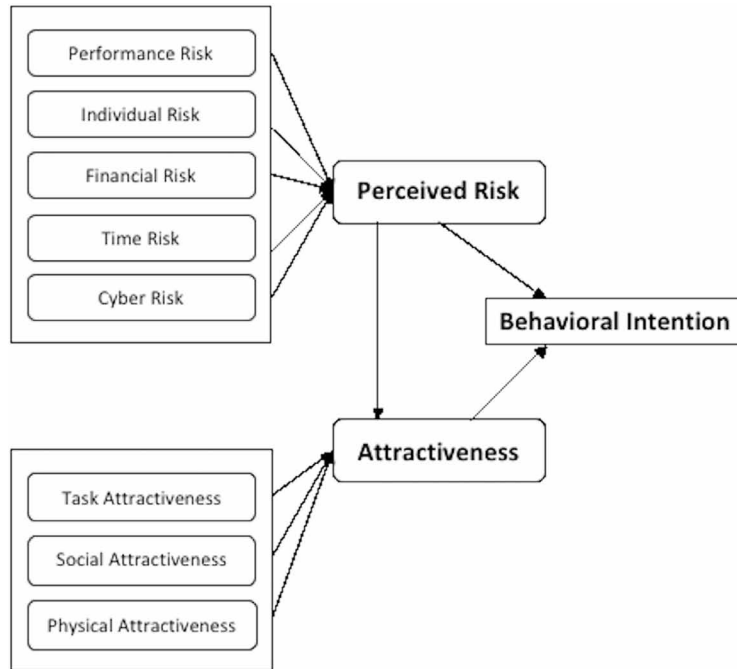
The conceptual model based on this theoretical analysis is presented in Figure 1.

## METHODOLOGY

### Collection of Data

To investigate the proposed research model, methods and techniques employed for data collection involved a primary research. The primary research involved gathering of data by conducting survey of 650 bank clients from selected commercial banks operating in the capital city of Bangladesh - Dhaka. As such, the unit of analysis were individual bank clients in this study. A non-probability sampling design of snowball sampling was used to obtain the required sampling population for this study. To ensure successful participants recruitment, a self-selection approach with already established contacts was initiated. This was followed by seeking contacts to recruit more participants from their personal and work contacts, which then resulted in the pursuit of the snowball approach. This particular sampling method was mainly used in this study since green banking is in its initial stages

Figure 1. Risk and attractiveness conceptual model



in Bangladesh banking sector. As a result, a limited number of commercial banks are currently using it in their banking services and a limited number of clients are aware of and exposed to such services. In such a scenario, a snowball sampling can adequately help to subjectively identify and qualify the prospective respondents for this study.

Prior to distribution, a pilot study across 50 respondents were carried out. This was mainly done to check the phrasing, relevance, language clarity and understanding of the questions with experts drawn from academia, citizens and practitioners. Results from the pilot study ensured the feasibility of the developed questionnaire to be used for the larger scale study. However, one source of common method variance or common source bias was identified by the researchers from the pilot study. Since data for both independent and dependent variables were being collected from the same respondents at one point in time, potential common method variance might be present in the data collected from the larger scale study. Acknowledging the presence of possible common source bias, some procedural remedies were undertaken during the main survey.

For the main study, both field and online survey was conducted. This approach was taken in order to increase the inclusion of few respondents who did not have access to online facilitating conditions to undertake the survey. Following Podsakoff et al. (2003), measurement of predictor and criterion variables were proximally or methodologically separated while conducting the field and online survey. In other words, respondents were made to complete the measurement of the predictor variable under conditions or circumstances that are different from the ones under which the measurement of the criterion variable were completed. For instance, different rooms were used in the field survey while different survey sites were used in the online surveys as the locational separation (Podsakoff et al., 2003). This resulted in eliminating the common retrieval cues of the respondents through the reduction of short-term memory.

As such, a total of 150 hardcopy of the questionnaire were distributed, among which 114 surveys were useable and the remaining were incomplete. Additionally, the online survey was conducted with 500 respondents, wherein 426 surveys had complete information. So, the sample size stood at 540

respondents out of 650 people approached for the data. A demographic analysis of the 540 respondents surveyed in this study showed 45% male and 55% female respondents. A total of approximately 35% of the respondents ranged across the ages of 21-30, while 28%, 21% and 16% of the respondents were in the age brackets of 31-40, 41-50 and above 50 years, respectively. The occupation profile of the respondents further revealed 35% of the respondents in private service, 20% in government service, 17% in self-employed businesses, 19% students and around 9% in the unemployed and retired category.

## Development of Instruments

According to Luarn and Lin (2005), items of the survey should be adapted from existing literature, since it ensures the content validity of the scales used in a questionnaire. Table 1 shows a display of the sources from where the constructs were adapted for the questionnaire used in this study. A total of 11 constructs can be found in the questionnaire - following the previous behavioral researches. items were adopted to the context of the green banking services. For the construct of perceived risk, 5 components were identified; while, for the construct of attractiveness, 3 components were included. A minimum of 3 items for each variable were maintained – resulting in 41 questions in the survey questionnaire. Details of the items are subsequently provided in the **Appendix**. The questionnaire consisted of close-ended questions that gauged the citizens' opinions about the green banking services using a five-point Likert scale, where "1" denoted as strongly disagree and "5" strongly agree.

## DATA ANALYSIS

According to Anderson and Gerbing (1988), a two-step approach should be followed for data analysis. This consists of a detailed assessment of the measurement models at the item level in the first stage and later an analysis of the posited structural relationships in the next stage. PLS path modeling approach is adopted to examine both the measurement and structural models, using version 3.2.6 of SmartPLS. The method of partial least squares (PLS) is chosen since a number of interaction terms have been included in the research model and PLS is capable of testing these effects (Chin et al., 2003). The PLS path modeling approach is also known to be more accurate in explaining the complex relationship than any other approaches (Pavlou and Gefen, 2005). In fact, PLS-SEM is stated to establish rigor in complex models since it can avert the limitations of covariance based Structural

**Table 1.** *Overview of the constructs*

Constructs	Adoption Sources
Performance Risk	Featherman and Pavlou (2003), Luo et al. (2010), Martins (2014)
Individual Risk	Venkatesh et al. (2003), Nisha et al. (2015), Park and Tussyadiah (2016)
Financial Risk	Featherman and Pavlou (2003), Martins (2014), Park and Tussyadiah (2016)
Time Risk	Featherman and Pavlou (2003), Luo et al. (2010), Park and Tussyadiah (2016)
Cyber Risk	Khalilzadeh et al. (2017), Iqbal et al. (2017)
Perceived Risk	Featherman and Pavlou (2003), Martins (2014)
Task Attractiveness	Loiacono et al. (2007), Shen et al. (2017)
Social Attractiveness	Phang et al. (2009), Shen et al. (2017)
Physical Attractiveness	Loiacono et al. (2007), Shen et al. (2017)
Attractiveness	Cyr et al. (2006), Lee (2009), Alsamydai et al. (2014)
Behavioral Intention	Rifat et al. (2016), Rifat et al. (2017)



Equation Modeling (CB-SEM) with regard to distributional properties, measurement level, sample size, model identification and factor indeterminacy (Akter et al., 2011).

For the purpose of analysis, both convergent validity and discriminant validity have been tested in order to assess the measurement model. The measurement model considered for this study is a formative model, whereby the causal action flows from the independent variables to the composite variables (Edwards & Bagozzi, 2000). In this study, the composite variables are the independent variables of perceived risk, attractiveness and behavioral intention. The two composite variables of perceived risk and attractiveness summarizes the common variation in a collection of indicators like the facets of perceived risk and the factors of attractiveness. On the other hand, the direction of path coefficients, value of t-statistics, and the explanatory power of the independent variables is tested for the structural model. Following Vinzi et al. (2010), reliability and validity has also been verified at each stage of the analysis in the current study. Moreover, the Kaiser-Meyer-Olkin (KMO) test was conducted for measuring the sampling adequacy to ensure the minimum standard before proceeding for factor analysis in this study. The statistic is also a measure of the proportion of variance among variables that might be common variance. The rule of thumb states that the values between 0.8 and 1 indicate that the sampling is adequate (Hai and Dung, 2017). In the current study, the value of KMO stood at 0.702, which is statistically significant and shows high data reliability for further analysis.

### **Assessment of The Measurement Model**

Following Campbell and Fiske (1959), a conformity analysis test has been conducted which includes both convergent validity and discriminant validity. This has been done in order to test the validity of the measurement model. Convergent validity measures whether the items effectively reflect their respective constructs, whereas discriminant validity shows whether the constructs are statistically different from each other. The convergent validity has been checked through the standardized item loadings, average variance extracted (AVE) and composite reliability (CR) of the items and constructs. The values for the measurement model are given below in Table 2. According to Guadagnoli and Velicer (1988), the minimum cut-off level for the values of item loadings has been considered as 0.60 for this study. To maintain this cut-off level, one item from each construct of performance risk (PfR2), time risk (TR3), and task attractiveness (TA2) had to be discarded. This is because all the other items had the item loading value of 0.70 and above, with the exceptions of the above listed items. This result indicates that all items effectively imitate their respective constructs. For AVE, 0.50 has been considered as the minimum cut-off level (Fornell and Larcker, 1981). Results indicate that all AVE values of the constructs of this study is well above 0.50. Next, 0.70 has been considered as the minimum cut-off value for composite reliability (Nunnally and Bernstein, 1994). Since most of the CR of the constructs in this study is above 0.80, it suggests internal consistency for the proposed model. Evaluation of all these values further suggest that the items surveyed under the proposed model of this study effectively reflect their respective constructs and hence poses a reasonable level of internal consistency.

Fornell and Larcker (1981) suggests that the square root of AVE of each construct should be greater than its highest latent variable correlation for the purpose of discriminant validity. Table 3 shows that the constructs used in this study satisfy this criterion, as represented by the square root of AVE of each construct of latent variables and all latent variable correlations. Observations suggest that the square root of AVE of each constructs stands highest among the values of their latent variable coefficients. This further suggests that the result of the Fornell-Larcker criterion is acceptable and the model poses good discriminant validity. Additionally, the internal consistency reliabilities (ICRs) of multi-item scales modeled with reflective indicators was 0.75 or greater, suggesting adequate reliability. The pattern of loadings and cross-loadings also supported internal consistency and discriminant validity, with three exceptions (PfR2, TR3, and TA2) as given above.

**Table 2. Standardized item loadings, composite reliability and AVEs**

Constructs	Items	Factor Loadings	Composite Reliability (CR)	AVE
Performance Risk	[PFR1] Green banking services may not perform well due to software failures.	0.7948	0.758	0.626
	[PFR3] Green banking services may create problems through malfunctioning and data corruption.	0.8395		
	[PFR4] Green banking services may fail in delivering the desired level of performance.	0.8293		
Individual Risk	[IR1] I feel apprehensive about using green banking services.	0.8049	0.840	0.610
	[IR2] I am scared of information loss due to my careless mistakes in using green banking services.	0.7209		
	[IR3] I hesitate using green banking services for fear of mistakes I cannot correct.	0.7453		
	[IR4] I feel green banking services are somewhat intimidating to me.	0.8111		
Financial Risk	[FR1] The chances of losing money while using green banking services are high.	0.7385	0.837	0.657
	[FR2] Using green banking services subjects me to potential fraud.	0.7028		
	[FR3] Using green banking services may lead to a financial loss for me.	0.7564		
	[FR4] Using green banking services subjects me to financial risk.	0.8555		
Time Risk	[TR1] There can be possible time loss from connection disruptions while using green banking services.	0.8143	0.789	0.698
	[TR2] Possible time loss from using green banking services can make me miss a deadline.	0.8028		
	[TR4] Possible time loss from using green banking services can make me switch to manual methods.	0.8002		
Cyber Risk	[CR1] Chances of losing privacy control of my information in using green banking services are high.	0.7777	0.799	0.651
	[CR2] Using green banking services subjects me to potential cybercrimes.	0.7364		
	[CR3] Green banking services may not be safe for transmitting personal sensitive information.	0.7135		
	[CR4] Using green banking services subjects me to my information being used without my knowledge.	0.7835		
Perceived Risk	[PR1] Using green banking services is dangerous.	0.8304	0.804	0.644
	[PR2] Using green banking services may add great uncertainty to my life.	0.8056		
	[PR3] Using green banking services may expose me to an overall risk.	0.8425		

*continued on following page*

Table 2. Continued

Constructs	Items	Factor Loadings	Composite Reliability (CR)	AVE
Task Attractiveness	[TA1] Green banking services offer pretty much what I need to carry out my banking transactions.	0.8946	0.855	0.687
	[TA3] Green banking services enhance my effectiveness in interacting with banks.	0.8029		
	[TA4] Green banking services make banking transactions I want to accomplish easier to get done.	0.7624		
Social Attractiveness	[SA1] It is easy to communicate with banks through green banking services.	0.7937	0.831	0.613
	[SA2] Green banking services help to form transparent relationships with banks.	0.7374		
	[SA3] Green banking services gives opportunity to recommend ideas to banks.	0.8626		
Physical Attractiveness	[PA1] The design of green banking service websites/applications is attractive.	0.8249	0.810	0.638
	[PA2] Green banking service websites/applications look professionally designed.	0.8485		
	[PA3] Green banking service websites/applications are visually pleasing.	0.7003		
	[PA4] The overall look and feel of green banking service websites/applications is visually appealing.	0.7049		
Attractiveness	[A1] I find green banking services attractive as it makes me more efficient.	0.8364	0.844	0.600
	[A2] I find green banking services attractive as it makes my life more convenient.	0.8507		
	[A3] I find green banking services attractive as it saves me time in doing my banking transactions.	0.8675		
	[A4] Overall, I find green banking services attractive since it is useful in my life.	0.8409		
Behavioral Intention	[BI1] I prefer to use green banking services.	0.8110	0.793	0.617
	[BI2] I intend to use green banking services.	0.8562		
	[BI3] I believe it is worthwhile for me to use green banking services.	0.7123		

## Assessment of The Structural Model

Past studies like Henseler et al. (2009) suggests that it is more vital to report the confidence intervals rather than just reporting the significance of the constructs. Thus, the confidence intervals and  $R^2$  value is employed to validate the structural paths of the conceptual model. In addition, the t-statistics are calculated using the path coefficients of the constructs and their bootstrapped standard errors, as presented in Table 4. To examine these structural paths of the proposed research model, the bootstrapping method from PLS path modeling approach has been used in this study.

Results reveal that the constructs of financial risk (0.276,  $p < 0.05$ ), time risk (0.263,  $p < 0.05$ ), individual risk (0.195,  $p < 0.05$ ), and cyber risk (0.182,  $p < 0.05$ ) show significant and positive paths to perceived risk of using the green banking services, in their order of influencing strength. Additionally, the constructs of task attractiveness (0.201,  $p < 0.05$ ) and social attractiveness (0.189,  $p < 0.05$ ) reveal significant and positive paths to degree of attractiveness of the green banking services. However, the constructs of performance risk (0.178,  $p > 0.05$ ) and physical attractiveness (0.120,  $p > 0.05$ ) report

**Table 3. Fornell and Larcker, Criterion**

	ICRs	A	BI	CR	FR	IR	PA	PfR	PR	SA	TA	TR
<b>A</b>	0.812	<b>0.847</b>										
<b>BI</b>	0.809	0.312	<b>0.953</b>									
<b>CR</b>	0.845	0.484	-0.134	<b>0.833</b>								
<b>FR</b>	0.833	-0.388	-0.245	0.122	<b>0.872</b>							
<b>IR</b>	0.818	-0.475	-0.209	0.194	0.135	<b>0.809</b>						
<b>PA</b>	0.800	0.023	0.317	0.153	0.105	0.136	<b>0.804</b>					
<b>PfR</b>	0.892	0.006	0.333	-0.067	-0.074	0.198	-0.033	<b>0.812</b>				
<b>PR</b>	0.856	0.037	0.167	-0.008	0.010	0.312	0.463	0.156	<b>0.864</b>			
<b>SA</b>	0.833	0.103	-0.005	0.075	0.179	0.278	0.047	0.056	0.231	<b>0.953</b>		
<b>TA</b>	0.824	0.147	0.032	-0.001	-0.007	0.294	0.413	0.009	0.201	0.263	<b>0.932</b>	
<b>TR</b>	0.850	0.169	-0.028	0.452	-0.073	0.112	0.423	0.184	0.111	0.135	0.085	<b>0.874</b>

Notes:

1. A (Attractiveness); BI (Behavioral Intention); CR (Cyber Risk); FR (Financial Risk); IR (Individual Risk); PA (Physical Attractiveness); PfR (Performance Risk); PR (Perceived Risk); SA (Social Attractiveness); TA (Task Attractiveness); TR (Time Risk).

2. Diagonal elements represent the AVEs, while off-diagonal elements represent the square correlations.

**Table 4. Path coefficients, t-statistics and hypotheses results**

Hypothesis	Path Coefficients (P)	Standard Error (STERR)	t-statistics (P/STERR)	Results
<b>H1a:</b> Performance Risk to Perceived Risk.	0.178	0.4881	0.3647	Not Supported
<b>H1b:</b> Individual Risk to Perceived Risk.	0.195	0.1324	1.4728	Supported
<b>H1c:</b> Financial Risk to Perceived Risk.	0.276	0.1111	2.4853	Supported
<b>H1d:</b> Time Risk to Perceived Risk.	0.263	0.1128	2.3309	Supported
<b>H1e:</b> Cyber Risk to Perceived Risk.	0.182	0.0930	1.9573	Supported
<b>H2a:</b> Task Attractiveness to Attractiveness.	0.201	0.0876	2.2945	Supported
<b>H2b:</b> Social Attractiveness to Attractiveness.	0.189	0.0835	2.2630	Supported
<b>H2c:</b> Physical Attractiveness to Attractiveness.	0.120	4.0816	0.0294	Not Supported
<b>H3:</b> Perceived Risk to Attractiveness.	-0.268	-0.1384	1.9364	Supported
<b>H4:</b> Perceived Risk to Behavioral Intention.	-0.251	-0.1352	1.8567	Supported
<b>H5:</b> Attractiveness to Behavioral Intention.	0.282	0.1608	1.7538	Supported

an insignificant path towards perceived risk and the degree of attractiveness of the green banking services, respectively. On the other hand, the construct of perceived risk (-0.268,  $p < 0.05$ ) actually depicts a significant but negative path to attractiveness – thereby, proving the theory of perceived risk and attractiveness in terms of the green banking services. Perceived risk (-0.251,  $p < 0.05$ ) also shows a significant but negative path to the behavioral intention of using the green banking services. Furthermore, attractiveness (0.282,  $p < 0.05$ ) reveal a significant and positive path to individual behavioral intention. This means that an inverse relationship exists between perceived risk and behavioral intention, while a direct relationship exists between attractiveness and behavioral intention of citizens about the use of green banking services in Bangladesh.

A minimum confidence level of 70% has been considered for the current study. As such, hypotheses H1b, H1c, H1d, H1e, H2a, H2b, H3, H4 and H5 are observed to have a confidence level of 70% or more. Among these selected hypotheses, H1c, H1d, H2a, H2b and H3 came out to be the most acceptable and significant ones with a confidence level of around 92.5%-95.9%. Two hypotheses (H1a and H2c) of this study did not meet the minimum standard level of confidence and so, they are declared to be insignificant for this study. Moreover, the  $R^2$  (coefficient of determination) values of all endogenous latent variables is used to explain the nomological validity of the proposed model of this study. As per the scope of the current study, the only endogenous latent variable here is behavioral intention (BI). According to Henseler et al. (2009), it is important that the  $R^2$  value is substantial when an endogenous latent variable depends on several exogenous latent variables. The  $R^2$  value for BI is 0.756, which means that the conceptual model of this study explains 75.6% of the variance of the behavioral intention to adopt green banking services and this result is quite significant.

Additionally, the predictive sample reuse technique ( $Q^2$ ) is effectively used as a criterion for determining the predictive relevance for the model (Stone 1974; Akter et al., 2011). Based on blindfolding procedure,  $Q^2$  has been obtained on the basis of cross validated redundancy whereby questionable blocks are predicted via the latent variables. Using an omission distance of 7, the study obtained a  $Q^2$  of 0.678 which is an indicative of a highly predictive model. This proves that the prediction of observables or potential observables is of much greater relevance than the estimated constructs. Hence, the proposed model and the structural model results is nomologically valid and the data collected empirically can be reconstructed with the help of the model and the PLS parameters.

## DISCUSSION

Primary findings of the study claim that task attractiveness significantly affects the adoption of green banking behavior of the clients in a positive light. This finding of the current study has been supported by Al-Momani et al. (2016), Alawan et al. (2016) and Hurbert et al. (2017). Martins et al., (2014) and Al-Momani et al., (2016), on the other hand, provide evidence that social attractiveness is a strong predictor of behavioral intention of technology. Therefore, the finding of this study that social attractiveness also plays a determining role in the adoption behavior of bank clients for green banking is supported.

In contrast, a number of perceived risks are identified in this study to be significant and positive factors for green banking service adoption. Results suggest that for this sample and context, financial risk, time risk, individual risk and cyber risk facets are the most salient causes for concern for green banking adoption. This finding of the current study has been supported by Yang et al, 2015, Martins et al. (2014); Mha (2015); Yang et al. (2015); Shankar and Kumari (2016); Alawan et al. (2016); Cherdantseva (2016), Gupta et al. (2017) and Hurbert et al. (2017). Therefore it can be concluded that the findings that all these four facets of perceived risk exert strong influence on the adoption behavior of bank clients for green banking services is sustained.

Additionally, findings of the current study showcase that perceived risk shares significant but an inverse relationship to both attractiveness and adoption behavior of bank clients for green banking. While, attractiveness posits a positive and significant impact upon the adoption of green banking behavior of the clients. These results are subsequently supported by the findings of the studies conducted by Nygren (1977); Weber (1992); Heijden (2003); Sonderegger and Sauer (2010); Mou & Cohen (2014); Liébana-Cabanillas et al. (2014); Enér and Knutsbo (2015); Al Khattab et al. (2015); Kansal (2016); Xie et al. (2017); Biucky & Harandin (2017) and Humbani & Wiese (2018). Hence, the findings of the study with regards to the relationships between perceived risk, attractiveness and behavioral intention are well supported.

## THEORETICAL IMPLICATIONS

The theoretical implications of this study can be understood in the following ways. First, this study enriches the literature on green banking services and its adoption and usage behavior in the context of a developing country. To the best of the authors' knowledge, there has been no significant study that conducts an in-depth investigation on influencing factors of green banking service adoption from a client's perspective and in the context of Bangladesh. Therefore, this study will improve our understanding of this emerging social-related phenomenon. It will also evoke academic investigations on the underlying mechanisms of client's intention to use green banking services. Second, this study highlights the role of an unconventional factor like technology attractiveness in promoting client's adoption of green banking services. Alongside attractiveness, perceived risks are also included in the conceptual research model. This has been primarily done based on the concept of Weber et al. (1992), who claims that attractiveness and perceived risk are closely related and there can be a presumed relationship between these two factors. In addition, Weber et al. (1992) argues that both perceived risk and attractiveness can eventually influence the behavioral intention of choosing an alternative. Systematic work on investigating users' intention to adopt any technological service has not been previously done based on this theory of perceived risk and attractiveness. Motivated by this observation and consideration, the current study identifies three dimensions of attractiveness for green banking - based on attractiveness theory presented by McCroskey and McCain (1974) and later, by McCroskey et al. (2006). Third, facets of perceived risks based on the definitions of Nygren (1977) and findings of Featherman and Pavlou (2003) are facilitated in the conceptual model of this study. In this regard, technology attractiveness aligned with perceived risks provides a new theoretical basis for future research on users' adoption of other technological services.

## RESEARCH IMPLICATIONS

Green banking attracts the clients by offering new channels of financial services delivery. Initially, this may have seemed as another option for communicating with clients for the banks. However, in the face of rising demands from demographic, economic, social and global trends, green banking no longer appears to be a matter of choice. Rather, it is a necessity for any country. Specifically, green banking services has the potential to improve the overall banking experience for the clients. This can happen through the reduction of the time and cost to both clients and banks through the innovative use of technology. In the light of the above discussions and findings of the study, the attractiveness of the green banking services thus needs to be highlighted for the bank clients. This can result in the mitigation of the perceived risks of the technological system and positively affect the adoption behavior for green banking amongst the clients.

Currently, Bangladesh is yet to reach a satisfactory level in balancing the attractiveness of the green banking services against its perceived risks among its bank clients. So, it becomes important for the Central Bank to monitor or supervise banks' activities more strictly. This can help to determine whether the banks are adopting the necessary measures to reach the required level, as outlined in the Green Banking policy formulated by Bangladesh Bank (Hossain et al., 2015). On the other hand, the banks should undertake the responsibility to educate their clients about green banking services, its benefits and usage processes. This will enable clients to have a more positive, supportive and encouraging attitude towards green banking practices in Bangladesh. The government can also encourage the general people about adopting green banking practices through awareness programs and help to improve the general perception of clients regarding green banking services.

## PRACTICAL IMPLICATIONS

Findings state that clients who expect less effort input in the service consuming process, especially at the adoption stage like that of green banking services in Bangladesh, are more likely to show positive attitude in embracing this service. Furthermore, results reveal that easy communication and better transparency with the banks are more likely to demonstrate positive attitude in embracing the green banking services in Bangladesh. This indicates that the task and social attractiveness aspect of the green banking technological services needs to be improved by the banks. Only then, a positive adoption intention of consumers towards green banking can be ensured.

However, financial risk is a strong factor that can influence individual willingness to adopt the services. This can be attributed to the fact that financial risk is associated with losing money and hence, it can be a matter of concern amongst the banking clients of the country. It should also be noted that any kind of human errors or time-related disruptions can further slowdown the process of availing green banking. For example, time loss from connection disruptions and inaccurate submissions by the clients may lead to time and individual risks. This can eventually lower the expectations of clients and making adoption more difficult. Moreover, cyber heists or other cyber-related crimes that are common to the cyberspace these days can also act as a hindrance to the adoption of green banking services by the clients. This is because cyber risks ultimately pose a threat to clients' online security and privacy matters. In considerations of the risk factors identified above, it is necessary for the banks and the government to ensure proper privacy policies and adequate security measures to mitigate the cyber and financial risks for the clients. To add more, strong facilitating conditions for connections and networks needs to be established across the country by the government authorities to deal with time risks. Also, training programs to use the technology and 24/7 customer support systems and call centers can be ensured by the banks to help their clients to adopt the green banking services.

Findings of the current study further indicate that an inverse relationship exists between perceived risks and attractiveness in terms of the green banking services. This suggests the criticality of controlling the risks perceived by the clients surveyed in general for this study. To pursue the purpose, a strong internal control system needs to be ensured that will be evaluated periodically. This will guarantee clients that confidentiality of information will be treated in an extremely secure environment, so that the information they have listed with the government cannot make them the victims of reprisals by disaffected banks. As such, the banks need to focus on direct marketing while attracting the clients in adopting green banking meanwhile social influences will work effectively and affect their intentions. Hence, the clients should be informed about new services and benefits related to green banking by the bank officials in order to enhance the chance of usage for such services. Additionally, most of the country's well-known banks have already managed to ensure a strong credibility among their target clients' through their convenient banking services and social attractiveness. Hence, green banking services often reduces the need of clients to physically visit the bank, thereby saving time for the clients. Therefore, the clients' needs to be aware of real the cost of using green banking is much lower than the traditional banking services in Bangladesh due to the increased use of internet and mobile devices at the cheapest possible price.

In a nutshell, a better control over the perceived risks of green banking can thus enhance the attractiveness of the service for the clients. While, lower perceived risks can lead to higher intention to adopt green banking—higher attractiveness can also increase the adoption rates of green banking services in Bangladesh.

## CONCLUSION

In Bangladesh, green banking services are potentially a route to the provision of better banking services and accessibility delivered to clients if merged with social and task attractiveness. While its social attractiveness and task-performing ability attracts clients, risks related to financial, time, individual and

cyber aspects often impede the adoption of such services. Hence, this study concludes that a stricter surveillance of the perceived risks of green banking services needs to be made so that its attractiveness can be uphold for the clients of the nation. This is definitely a necessary step since the innovation and digitalization brought forward by green banking services cannot be negated. Implementation of green banking might be a long-term project in Bangladesh, therefore, the government and the central bank of Bangladesh should be more forthcoming in this regard by making budgetary allocations and by providing more financing facility for extensively implementing green banking in the financial sector of the country.

## **LIMITATIONS AND FUTURE DIRECTIONS**

The scope of this study is limited green banking services as offered by the banks in Bangladesh. It will be worthwhile to study the same in different country contexts. Future research can explore behavioral intention of urban and rural clients as well to draw conclusions regarding the risk and attractiveness of green banking services. Moreover, this study has mainly emphasized on the assessment of client's perception towards green banking. A longitudinal study may also be adopted in future works that can examine the perspectives of financial institutions providing such services. Finally, other than the risk and attractiveness dimensions included in this study, there can be other related constructs characterizing the use of green banking services or moderator effects like age, gender, and voluntariness that can add further value to this study area.



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## APPENDIX

**Table 5. Constructs and corresponding items**

Constructs	Corresponding Items
Performance Risk	[Pfr1] Green banking services may not perform well due to software failures. [Pfr2] Green banking services may compromise my security through virus and malware attacks. [Pfr3] Green banking services may create problems through malfunctioning and data corruption. [Pfr4] Green banking services may fail in delivering the desired level of performance.
Individual Risk	[IR1] I feel apprehensive about using green banking services. [IR2] I am scared of information loss due to my careless mistakes in using green banking services. [IR3] I hesitate using green banking services for fear of mistakes I cannot correct. [IR4] I feel green banking services are somewhat intimidating to me.
Financial Risk	[FR1] The chances of losing money while using green banking services are high. [FR2] Using green banking services subjects me to potential fraud. [FR3] Using green banking services may lead to a financial loss for me. [FR4] Using green banking services subjects me to financial risk.
Time Risk	[TR1] There can be possible time loss from connection disruptions while using green banking services. [TR2] Possible time loss from using green banking services can make me miss a deadline. [TR3] Possible time loss from using green banking services is high. [TR4] Possible time loss from using green banking services can make me switch to manual methods.
Cyber Risk	[CR1] Chances of losing privacy control of my information in using green banking services are high. [CR2] Using green banking services subjects me to potential cybercrimes. [CR3] Green banking services may not be safe for transmitting personal sensitive information. [CR4] Using green banking services subjects me to my information being used without my knowledge.
Perceived Risk	[PR1] Using green banking services is dangerous. [PR2] Using green banking services may add great uncertainty to my life. [PR3] Using green banking services may expose me to an overall risk.
Task Attractiveness	[TA1] Green banking services offer pretty much what I need to carry out my banking transactions. [TA2] Green banking services adequately meet my banking information needs. [TA3] Green banking services enhance my effectiveness in interacting with banks. [TA4] Green banking services make banking transactions I want to accomplish easier to get done.
Social Attractiveness	[SA1] It is easy to communicate with banks through green banking services. [SA2] Green banking services help to form transparent relationships with banks. [SA3] Green banking services gives opportunity to recommend ideas to banks.
Physical Attractiveness	[PA1] The design of green banking service websites/applications is attractive. [PA2] Green banking service websites/applications look professionally designed. [PA3] Green banking service websites/applications are visually pleasing. [PA4] The overall look and feel of green banking service websites/applications is visually appealing.
Attractiveness	[A1] I find green banking services attractive as it makes me more efficient. [A2] I find green banking services attractive as it makes my life more convenient. [A3] I find green banking services attractive as it saves me time in doing my banking transactions. [A4] Overall, I find green banking services attractive since it is useful in my life.
Behavioral Intention	[BI1] I prefer to use green banking services. [BI2] I intend to use green banking services. [BI3] I believe it is worthwhile for me to use green banking services.

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