

# Can Central Bank Survive the Green Banking Revolution? A Case of Bangladesh Bank

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## ABSTRACT

Various eco-friendly services, broadly known as green banking, are now part of most banking activities. These services relate to banking transactions conducted less on paper and more over an electronic platform. This new form of technology is being used with increasing frequency in low carbon-emitting countries like Bangladesh to promote environmental sustainability. Despite the central bank playing a prominent role in this vision development, surprisingly the level of green banking adoption is still low among its employees. This study thus aims to identify factors that affect bank employee use of green banking, by integrating management support, customer and competitor pressure with a technology acceptance model. Findings indicate that the perceived ease of use influences perceived usefulness, whose impact is then observed upon actual use. It is also quite lucid that both management support and customer pressure have substantial impact on green banking adoption for central bank employees.

## KEYWORDS

Bangladesh, Central Bank, Customer and Competitor Pressure, Green Banking, Management Commitment and Support, Perceived Ease of Use, Perceived Usefulness

## INTRODUCTION

In the era of globalization and industrialization, ‘global warming’ is resulting from the increased pollution and negative externalities created by the industries and firms. Even the banking industry is not anomalous in case of increasing the greenhouse gas that leads to the rise in global warming (Hussin and Kunjuraman, 2015). As a result, banks today have come forward to subsidize this menace as much as possible. To pursue this purpose, a number of banks across different countries are adopting green banking to abate the impact of the negative externality created by the banks (Khawaspatil and More, 2013).

Green banking involves the environmental and social responsibility of banks in terms of the contribution they make towards ensuring sustainability of environment and ecological system (Nisha, 2016a). Green banking generally involves two-pronged approaches. Firstly, green banking focuses on the green transformation of internal operations of all banks. It means the banks should adopt appropriate ways of utilizing renewable energy, automation and other measures to minimize carbon footprint from banking activities (Jha and Bhome, 2013). Secondly, all banks should adopt

DOI: 10.4018/IJABIM.2020070104

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environmentally responsible financing. This includes weighing up environmental risks of projects before making financing decisions and supporting and fostering growth of upcoming 'green' initiatives and projects (Masukujjaman and Akter, 2013). For instance, using online banking instead of branch banking, paying bills online instead of mailing them, opening up CDs and money market accounts at online banks instead of large multi-branch banks (Bahl, 2012).

Although green banking is a global initiative, these eco-friendly policies play a special role particularly for those developing countries which are more vulnerable to climate changes and where natural calamities are a common phenomenon (The Financial Express, 2013). One such example is that of Bangladesh, which is a low carbon emitting country and has historically suffered huge losses due to changes in climate patterns. As a result of these adverse effects and to initiate a progressive step worldwide, the central bank of the country, Bangladesh Bank, has shown a profound commitment towards the vision of green banking. It has opted towards congenial business operations that are sustainable towards the environment in 2011 through their Green Banking Policy (Ahmad et al., 2013). This step by Bangladesh Bank is in itself a unique one, since it is probably the only central bank which has issued such an indicative guideline for green banking in the South-Asian continent (Rifat et al., 2017).

While green banking promotes environmental sustainability and socially responsible investments, the main challenges in its adoption lies in its technological aspects as well as the influence of various stakeholders involved with the central bank. According to Islam and Kamruzzaman (2015), if green banking services appears confusing or inconvenient, there is a high possibility that employees are not going to adopt the use of green banking services in their daily operations. Moreover, if central bank employees perceive that the use of green banking services may not particularly enhance their daily functionalities inside the bank, adoption is going to be even more difficult (Hossain et al., 2016). On the other hand, the central bank has a social responsibility that requires it to consider the interests of all parties affected by their actions. In accordance with stakeholder theory, there are several groups or individuals who benefit from or are harmed by, and whose rights are violated or respected by, corporate actions (Antonelli et al., 2017). This means that the central bank must keep the interests of these various stakeholders like the management, customers, competitors, and employees aligned and going in the same direction. As such, the interests of the stakeholders can also be crucial for the adoption of green banking services besides its technological aspects.

In particular, individual attitudes of central bank employees are often important in such cases. Green banking implementation is not likely to be successful if the employees are not motivated to use it as part of their work environment (Al-Smadi, 2012). In fact, such environment-friendly business practices can only be ensured by the central bank if employees are willing to adopt it. This is because only employees among other stakeholders are at the forefront of execution of the green banking initiatives inside the bank (Nisha et al., 2015). Moreover, the pressure of customers, management and competitors can also drive the central bank employees to adopt green banking services inside the bank. It is thus important to examine the outlook of bank employees with regard to green banking initiatives employed in the central bank. Hence, the primary focus of this research is to find the relevant factors that are required to influence central bank employees' behavioral intention to adopt green banking in Bangladesh.

To the best of the authors' knowledge, systematic work on investigating bankers' intention to adopt any technological service has not been previously done based on the stakeholder theory by any researchers. In this regard, management support and individual employees' attitude are considered as internal and competitors and customers' pressures are taken as external stakeholder interests. Besides, technological aspects based on technology acceptance model (TAM) has also been considered for the adoption of green banking services by the bank employees. To conduct this research, Partial Least Squares (PLS) is applied to investigate the underlying relationships related to the perceptions of bankers towards green banking practices. This technique has the ability to isolate observational error from measurement of latent variables like the proposed constructs in this study. Thus, the use

of a principal component-based approach to estimation under PLS is the unique contribution of this study. Findings of this research will provide further insights into identifying the factors that can influence the thought process of bank employees into adopting and using green banking in their work environment. This study can also assist the central bank, along with other commercial and state-owned banks to understand and assess the level of social responsiveness of bankers in the context of emerging economies like Bangladesh.

## REVIEW OF LITERATURE

With regard to green banking, a limited number of studies have been conducted in the context of Bangladesh. For instance, Rahman (2012) and Masukujjaman and Aktar (2013) highlighted the green banking road map in Bangladesh, the status of its implementation and also explored the activities of commercial banks in comparison with global green banking initiatives. Both studies concluded that Bangladesh is far behind their counterparts from the developed countries, but as of now, most of the banks are in a transition to green banking in the country. Ullah (2013) then conducted a comparative analysis among different types of banks operating in Bangladesh and tried to conclude whether the banks have properly adopted the Green Banking Policy guided by the Bangladesh Bank. Findings by Ullah (2013) claimed that only public and foreign commercial banks have invested in green banking projects whereas the initiatives of state-owned commercial banks or state-owned specialized development banks are nothing remarkable to be reported.

Next, Ahmad et al. (2014) explored the green banking activities of all commercial banks in Bangladesh and attempted to determine the reasons behind adopting green banking from the perspective of bank employees. Six factors namely economic factor, policy guideline, loan demand, stakeholder pressure, environmental interest and legal factor were found to be the major influencers regarding the adoption of green banking by the commercial banks. Shakil et al. (2014) also did an evaluation of green banking practices among the scheduled banks of Bangladesh and found that while some banks have taken certain green banking initiatives, there are still a good number of banks which are in the first phase of the Green Banking policy guideline set by Bangladesh Bank. Findings by Shakil et al. (2014) further stated that it is due to large initial cost and lack of governmental and technical support, that green banking practices is not implemented on a large scale in Bangladesh. Rahman et al. (2015) alternatively suggested that banks in Bangladesh can go green by bringing changes in six main spheres of banks' activities like investment management, deposit management, housekeeping, process of recruitment and development of human capital, corporate social responsibility (CSR) and client awareness. Along the same line, Islam and Kamruzzaman (2015) and Rahaman et al. (2015) studied the guidelines for green banking practices of Bangladesh banks and specifically focused onto their activities related to mobile banking, online banking, green financing and other functions of the green banking units.

Furthermore, there are a number of local studies which were conducted related to various aspects of green banking practices in Bangladesh. While Masum (2015) highlighted the need for green banking in Bangladesh, Hossain and Ahmed (2015) outlined the phases of implementation under the Green Banking Policy guidelines set by the Bangladesh Bank. Next, Hossain et al. (2015a) explored consumer attitudes and perceptions towards green banking in Bangladesh while another study by Hossain et al. (2015c) analyzed the future of green banking for the country. With respect to promoting a greener economy, studies by Nisha et al. (2015) and Nisha (2016b) did an empirical analysis to understand the factors behind consumer acceptance and use of mobile banking services in Bangladesh. In addition, Hossain et al. (2015b) evaluated the option of Islamic finance as a greener alternative for the banking sector of Bangladesh.

Recent studies by Masukujjaman et al. (2016) perceived green banking and Islamic banks to be more compatible and interlinked compared to other forms of banks in Bangladesh. Findings of this study also reported that bank employees were highly in favor of adopting green banking in order to

protect the environment despite its high adoption cost. Nisha (2016a) supported this claim by stating that the perception of bankers towards environmental protection, care and sustainability was quite positive. Additionally, Nisha (2016a) argued that since green banking initiatives has made working conditions more convenient, the bank employees are mostly in favor of such initiatives and its related products/services. Hossain et al. (2016), on the other hand, studied the reporting aspects of green banking issues of banks in Bangladesh and claimed that all scheduled banks follow the central bank policy as a guideline to publish their green banking activities. Rahman et al. (2015) further contributed to the literature by conducting a comparative study regarding the green banking initiatives of state-owned and foreign commercial banks in Bangladesh. Findings of this research also provided useful lessons for redesigning green banking practices in developing economies around the world.

Overall, if a conclusion is drawn from these past studies, it can be observed that only the significant researches of Ahmad et al. (2014), Masukujjaman et al. (2016) and Nisha (2016a) considered the perspective of bank employees towards the concept of green banking. However, none of these studies highlighted the central bank employees in their research. In view of everything, this is therefore a crucial aspect that needs to be further studied. As such, this study focuses on the examination of the perception of Bangladesh Bank employees towards the adoption of green banking initiatives in the context of Bangladesh.

## **GREEN BANKING AND BANGLADESH BANK**

As a response to environmental degradation, Bangladesh Bank inaugurated a new distinctive segment in the central bank by the name – Green Banking and CSR Department. The aim of this department is to monitor the construction and execution of policies and strategies which fall under green banking, green financing and the green refinance schemes initiated by the central bank (Masukujjaman and Akter, 2013). Under the green banking policy, a number of major activities are to be considered. For instance, green banking unit, policy, and budget, mobile and internet banking, allotment of funds in green financing and environment risk rating (Rahman and Barua, 2016). Within these directives, the central bank employees were instructed to give priority to the efficient use of resources and safety of the earth. Not only that, the central bank employees were to specifically follow the indicative strategy framework so as to ensure sustainable banking practices in the country.

In this regard, Bangladesh Bank employees had to first initiate their own Green Banking Unit (GBU) for pursuing green banking activities in the central bank. They were provided with a Green Office Guide for conducting various in-house green activities as well. For instance, employees were instructed to use e-statements instead of paper statements, make online communications, and use more daylight instead of electric lights or use energy saving bulbs like LED lights (Rifat et al., 2017). Additionally, employees were to use more daylight instead of electric lights and proper ventilation in lieu of using air conditioning, convert Bangladesh Bank's vehicles into CNG and use energy efficient electronic equipment (Nisha, 2016a). Furthermore, employees were to employ video/audio conferencing instead of physical travel, share electronic files, voice mail, and e-mail instead of paper memos, ensure efficient use of office stationeries, printer cartridges, and photocopy toner (Shakil et al., 2014). Moreover, the employees were to promote mobile and online banking, include environmental sustainability support initiatives in CSR programs, and provide financial support to climate risk fund and energy saving practices across the country (Hossain et al., 2015a). Furthermore, Bangladesh Bank employees had to work towards introducing a number of refinance lending for renewable energy generation, effluent treatment plants and energy efficient kilns for manufacturing bricks (Islam and Kamruzzaman, 2015).

Externally, most of these green banking initiatives have been successfully carried out by the central bank employees. In fact, Bangladesh Bank employees made quite a stir by introducing the mobile financial services (MFS) in Bangladesh as part of their green investments. Moreover, a revolving refinancing fund has been placed by the employees in the areas of solar irrigation pumps,

solar home systems, biogas plants, effluent treatment plants, brick kiln and solar photo voltaic module assembling plants (The Daily Observer, 2015). Other prominent examples of green banking activities by Bangladesh Bank employees include effective wastage management and efficient energy systems, tree planting initiatives, the use of renewable energy and installation of eco-friendly solar panels, provision of loan to environment-friendly buildings and land projects (The Financial Express, 2015a). Bangladesh Bank employees has also commenced a new Export Development Fund worth about US\$ 500 million to support environment-friendly industrial and development projects in the country, as a global response to save the environment (The Financial Express, 2015b).

However, when it comes to the green revolution of internal operations through the consumption of renewable energy, digitalization and other measures, there has been very less progress inside the Bangladesh Bank (Inderst et al., 2012). One of the major obstructions for green banking adoption within the central bank has been the individual attitude of bank employees. All employees of Bangladesh Bank were instructed to implement various methods of green banking within their operational structures for both their banking transactions and in-house activities. Yet, certain inhibitions regarding its performance and ease of use initiated resistance from the operational staff of the central bank (Nisha, 2016a). First, changes in the style of working and in the overall working space under green banking resulted in problems like coordination among all concerned authorities for green banking (Rifat et al., 2017). Second, proper awareness and effective implementation, immediate concentration on lending policies, and high costs of implementation gave rise to conflicts among management and employees (Nisha, 2016a). All these adversely affected individual employees' attitude and therefore their behavioral intentions towards the adoption of green banking services within their daily functionalities.

On the other hand, Bangladesh Bank employees had to speed up awareness and effective capacity building in order to meet customers' need to go green and their environmental sustainability demands (Nisha, 2016a). Additionally, employees were instructed to share knowledge and technical knowhow with peer groups of other scheduled banks, and replicate best green practices within central bank in very short span of time (Hossain et al., 2016). The intense competitive pressure to relay knowledge to other banks and increasing customer needs for green banking created more work pressure for the central bank employees. Besides, employees were required to provide technical assistance related to green banking, and prepare guidelines for effective environmental risk management, environmental risk rating and credit risk management (Rahman and Barua, 2016). This excessive demand of support from the bank employees that management requires further adversely affected their behavioral intentions towards green banking adoption. In view of such huge responsibilities and work pressure, adoption of green banking can certainly become a challenge for the central bank employees. As such, it is necessary to provide an insightful understanding of factors that can explain the intention of green banking adoption by central bank employees in Bangladesh.

## **THEORETICAL BACKGROUND**

To pursue the purpose of this research, a conceptual framework has been developed on the basis of Technology Acceptance Model (TAM) and stakeholder theory. Stakeholder theory has been established based on the notion that every institution should maintain and harmonize the interests of the management, customers, competitors, and employees. According to stakeholder theory, organizations need to consider the interest of "any group or individual who can affect, or is affected by, the achievement of a corporation's purpose" (Freeman, 1984). Mostly, it is very critical to observe for the successful adoption of a technology or the desired technological upgrade hinge upon the decision-making factors and methods of the stakeholders (Freeman, 2017). This study explores the interests and concerns of employees of the central bank regarding the adoption of green banking services through TAM based on a stakeholders' influence on acceptance.

The technology acceptance model (TAM), which was proposed by Davis (1989) and Davis et al. (1989) is an extensively used framework that explains the reasons behind the adoption of a

particular innovation. The model was formerly adopted from another broadly used theory called theory of reasoned action (TRA) which explains an individual's behavior through his intentions (Fishbein and Ajzen, 1975). According to TAM, behavioral intention is influenced by individual behavior to technology that consists of perceived usefulness (PU) and perceived ease of use (PEU) through mediation of attitude. This model assumes that a prospective user of a technology always weighs the possible benefits against the challenges before adopting or rejecting it (Davis et al., 1989). The model has been revised in many studies to fit a particular context of technology being investigated. One important and well-received revision of TAM is TAM 2 which includes social influence as a factor in predicting the usage behavior of a new technology by the users (Venkatesh and Davis, 2000). However, one weakness of TAM is, it does not consider the roles of other users in influencing an individual's attitude toward a technology. Moreover, sometimes there are situations when the potential user is not able to reject a particular technology because it is mandated by the top management. Besides, external pressure from customers or competitors can also be another reason behind the acceptance of a technology (Irani et al., 2003; Chae and Poole, 2005). Hence, to better explain adoption intention of green banking services from the perspective of central bank employees, we assimilate factors from stakeholder theory with TAM in this study.

## **HYPOTHESES DEVELOPMENT**

Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are the first two factors that are used in this study to explicate the behavioral intention of adopting green banking services by central bank employees. An impressive body of academic research like Morgan-Thomas and Veloutsou (2013), Park and Kim (2014), Dahlberg et al. (2015), Muthu et al. (2016), Huang (2017) and such others often used PU and PEU as constructs to check the effect of users' perception regarding the usefulness of a technology on the intention to use it. These two factors have been confirmed to have both direct and indirect association with behavioral intention of accepting a technology (Acheampong et al., 2017).

Perceived Usefulness (PU) defines prospective user's subjective probability that using green banking service improves operations (Lu et al., 2003). It is the subjective possibility that adopting a technological innovation will advance the way an individual finishes a task. In this research context, a noteworthy reason behind the usage intention of green banking can be a judgement that it will be advantageous to the bank employees. It implies that members within an organization are going to avail certain benefits with the use of green banking, if they adopt it internally and externally. The effect of PU on technology adoption has been validated in many existing literatures but in this case, it has been used for the adoption of green banking among central bank employees - following Al-Smadi (2012) and Arif et al. (2016).

Alternatively, PEU is a function of an individual's overall perception of how simple a new technology will be. It measures the prospective user's assessment of the mental efforts required of the use of the target applications (Davis, 1993). In the context of this study, PEU can be defined as the degree to which it is easier to adopt and provide green banking services by the bank employees. All else being equal, an application perceived to be easier to use than another is more likely to be accepted by users (Luarn and Lin, 2005). Prior studies like Alshibly (2011) and Aboelmaged and Gebba (2013) suggest that PEU is a critical factor affecting intention to adopt green banking service and a positive relationship exists here.

PEU is a distinct but related construct to PU since its impact on near-term usefulness and improvement in it contributes positively to outcomes and ultimately defines PU. Findings of the studies conducted by Mortimer et al. (2015), Muthu et al. (2016), Sharma et al. (2016) and Dong et al. (2017) report both PU and PEU to be major determinants of technology acceptance at the backdrop of innovative services. In their study, Alharbi and Drew (2014) and Rauniar et al. (2014) claim that PEU significantly influences PU of a technology, while together they influence an individual's attitude

towards its usage intention. So, it can be assumed that PEU will have positive impact on PU in terms of green banking services. Therefore, the following hypotheses are proposed:

- H1:** Perceived Usefulness (PU) significantly influence Attitude towards Usage (ATU).
- H2:** Perceived Ease of Use (PEU) significantly influence Attitude towards Usage (ATU).
- H3:** Perceived Ease of Use (PEU) significantly influence Perceived Usefulness (PU).

The subsequent elements that are used in this study to envisage the adoption intention of green banking services by central bank employees are extracted from stakeholder theory.

First, individual attitude has been considered that can be defined as an individual's positive or negative feelings about performing a target behavior (Davis, 1993). In this regard, Attitude towards Usage (ATU) explains a person's favorable or unfavorable assessment regarding the behavior in question (Davis et al., 1989). Based on concepts of TAM, attitude is related to behavioral intention because people form intentions to perform behaviors toward which they have a positive effect. According to Zhang (2007) and Zhang and Sun (2009), decisions can be affected by interventions that produce change in attitudes, and that past behavior contributes to the prediction of later behavior when circumstances remain relatively stable. If the attitude to use is positive, then users opt for adoption. Similar results are reported in technology acceptance studies like Srivastava et al. (2013) and Ahmed et al. (2014). In terms of green banking services, this implies that the relationship between attitude towards using green banking and Behavioral Intention (BI) to adopt green banking can be positive. Thus, the following hypothesis is proposed:

- H4:** Attitude towards Usage (ATU) significantly influence Behavioral Intention (BI).

Second, Management Support (MS) refers to the involvement, enthusiasm, motivation and encouragement provided by management towards the acceptance of green banking – in this case, among the central bank employees (Sharma and Yetton, 2003). Management support is used to gauge stakeholders' influence on technology acceptance. Top management plays an animated role in the adoption of green banking as it leads the distribution of resources, integration of services, and re-engineering of processes. In this process, top management demands an extensive level of support from bank employees to adopt green banking and effectively implement it in their daily functionalities. When top managers in any organization understand the relevance of new service or use of technology for service, Gu et al. (2009) claims that they tend to play a vital role in influencing other organizational members to accept it. Prior studies like Ifinedo (2011) and Martins et al. (2014) suggest that MS is a critical factor affecting Behavioral Intention (BI) to adopt green banking service. Hence, it has been proposed that:

- H5:** Management Support (MS) significantly influence Behavioral Intention (BI).

Third, competitors' pressure (CP) may lead a firm to adopt an innovation, even when it does not perceive many advantages from the use of that innovative technology (Ifinedo, 2011). Competitive pressure may also lead firms to adapt their strategies according to the new technology, particularly if there is fierce rivalry and uncertainty with regard to what competitors are doing (Martin et al., 2012). Some of the past studies like Mazhar et al. (2014) and Wonglimpiyarat (2014) claim that competition have increased in banking sectors today owing to digitalization and globalization. In this research context, central bank is a role model for other scheduled banks and the need to relay knowledge to the competitors often pose a pressure for the employees. As such, bank employees in the central bank may have to adopt green banking services to motivate other banks for similar adoption. Therefore,

pressure of other banks can influence the Behavioral Intention (BI) to adopt green banking services. As such, the proposed hypothesis is:

**H6:** Competitors' Pressure (CP) significantly influence Behavioral Intention (BI).

Finally, the movement towards information technology can be a response or reaction to an event or individual (Riemenschneider et al., 2003). As Pavlou and El Sawy (2006) argues, this can be a change or an emphasis on improving efficiency that has its origin in the pressure from customers. Customer pressure can be defined as the extent to which an organization's customers who have adopted an innovation pressurize the organization to use it (Teo et al., 2003). Typically, organizations must obey to the pressures from customers by adopting a technology that has already been accepted by them as these organizations might otherwise seem to be retrospective to them. It has also been largely demonstrated by Mishra and Bisht (2013) and Zameer et al. (2015) that delivering higher level of customer service and better communication with distant customers are some of the major determinants of green banking adoption. Thus, the proposed hypothesis is:

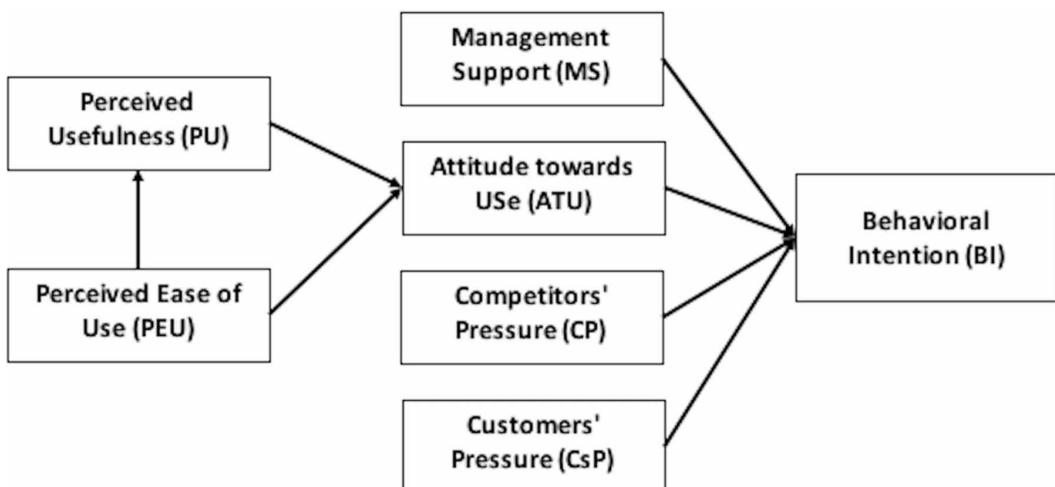
**H7:** Customers' Pressure (CsP) significantly influence Behavioral Intention (BI).

The proposed research model used to address the influencing factors for green banking adoption for central bank employees is therefore presented in Figure 1.

## RESEARCH METHOD

The conceptual model of this study is relatively complex and the phenomenon under study is new. This is because central bank employees have never been made the object of research till date, to the best of knowledge. Due to the relatively small sample size, Partial Least Square (PLS) based upon Structural Equation Modeling (SEM) is adopted for the data analysis. PLS has been particularly used because it makes minimal demands on the data distributions, sample size and measurement scales and since this study is exploratory in nature, it is a better tool to explain the data (Gholami et al., 2013).

Figure 1. Conceptual research model





Data for this research have been collected from both primary and secondary sources. The primary research involved gathering of data by conducting survey of a representative convenience sample. The use of this particular sampling method allowed us to avoid biasness in data and provided equal opportunity for all bankers who are currently employed in the central bank of Bangladesh. Bankers, in this case, represented both mid-level and low-level management. This is because it is the middle-level managers who execute services like green banking in the organizational plan of the banks while the low-level managers ensure the control and direction of such services in conducting and providing banking transactions. Hence, perceptions of both these two levels of management is necessary to conduct this study. To develop questions for the survey, prior studies like Ifinedo (2011), Lin (2011), Al-Smadi (2012) and Martin et al. (2012) has been followed. All the items used to measure the research variables of the survey were adapted from these previous studies, with minor changes in wording to tailor them to the different green banking context from the bankers’ perspectives in Bangladesh. This ensured the content validity of the questionnaire used to assess each constructs depicted in Figure 1. In total, 33 questions have been used to prepare the questionnaire, as listed in Table 1 – wherein, the items were measured using a six-point Likert scale, ranging from “strongly disagree” to “strongly agree”.

**Table 1. Constructs and corresponding items**

Constructs	Corresponding Items
Perceived Usefulness (PU)	(PU1) Using Green Banking would increase the quality or output of banking. (PU2) Adoption of Green Banking would help increase our revenues/profits. (PU3) Adoption of Green Banking would help increase our bank’s returns on investments (ROI). (PU4) Adoption of Green Banking would help us to serve our customers better. (PU5) Green Banking services enhance the bank’s image. (PU6) Green Banking activities increase our profitability.
Perceived Ease of Use (PEU)	(PEU1) I think that learning to use Green Banking services would be easy. (PEU2) I think that interaction with Green Banking services does not require much mental effort. (PEU3) I think it is easy to use Green Banking services to accomplish my banking tasks. (PEU4) My interaction with Green Banking is clear and understandable.
Attitude towards Use (ATU)	(ATU1) I feel using Green Banking is a wise idea. (ATU2) I feel using Green Banking is a good idea. (ATU3) I like the idea of using Green Banking services. (ATU4) Using Green Banking services is an exciting idea.
Competitors’ Pressure (CP)	(CP1) Some of our competitors have already started providing Green Banking services. (CP2) My bank would experience a competitive disadvantage by not using Green Banking. (CP3) The rivalry among banks in the banking sector is very intense. (CP4) It is easy for customers to switch to another bank for similar services.
Customers’ Pressure (CsP)	(CsP1) The banking industry is pressuring us to adopt Green Banking. (CsP2) Customers are pressuring us to adopt Green Banking. (CsP3) Suppliers and depositors are pressuring us to adopt Green Banking. (CsP4) We know our customers are ready to do business within Green Banking guidelines. (CsP5) Our customers are demanding the use of Green Banking in doing business with them.
Management Support (MS)	(MS1) Management is interested in the use of Green Banking services in banking operations. (MS2) Management is supportive towards Green Banking. (MS3) Our bank has a clear vision regarding the use Green Banking. (MS4) Our bank has a good understanding of how Green Banking can be used in our business. (MS5) All necessary technical, managerial and other skills to implement Green Banking exists.
Behavioral Intention (BI)	(BI1) We would use Green Banking services for our banking needs. (BI2) I would see myself using Green Banking services for handling my banking transactions. (BI3) My bank intends to use Green Banking within near future. (BI4) My Bank plans to use Green Banking. (BI5) My Bank is determined to use Green Banking soon.

The survey questionnaires were disseminated in the form of only hard copies. Prior to distribution, phrasing, relevance, language clarity and understanding of the questions were checked with experts drawn from academia, bank employees and practitioners. Around 250 printed copies of the questionnaire were distributed among the employees of Bangladesh Bank. After a three-week survey, 205 completed and usable responses were finally obtained from the respondents. Besides, most of the secondary data have been collected from Internet and several journals and articles which were published in different countries and time related to Bangladesh Bank and its green banking initiatives.

A two-step approach relative to Anderson and Gerbing (1988) was then followed for data analysis in this study. A detailed assessment of the measurement models at the item level and higher-order level were done at the first stage and later an analysis of the posited structural relationships was conducted in the next stage. Reliability and validity was verified at each stage of the analysis (Vinzi et al., 2010). PLS path modeling approach was adopted to examine both the measurement and structural models, using version 2.0 of Smart PLS. The model has also been extensively tested for convergent validity and discriminant validity for assessing the measurement model while for the structural model, the direction of path coefficient, the value of t-statistics, and the explanatory power of the independent variables have been tested.

## **DATA ANALYSIS AND RESULTS**

### **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. Results from the measurement model are presented in Table 2 and Table 3 and it includes information about the reliability, validity, correlations and factor loadings.

The composite reliabilities of the constructs ranged between 0.811 and 0.895, which exceeds the 0.7 recommended cut-off values (Nunnally & Bernstein, 1994). 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. The AVE was greater than 0.5 in all cases and greater than each square correlation, which indicates that the model has both convergent validity and discriminant validity (Fornell and Larcker, 1981). Moreover, 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 some exceptions: two items from the construct of perceived usefulness and customers' pressure; and, one item from each construct of perceived ease of use, competitors' pressure and behavioral intention were deleted, due to their low loadings and high cross-loadings. 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.

### **Structural Model**

Having established the validity of the measurement model, attention is turned to the structural model analysis. For this purpose, information related to the path coefficients and the squared R in the model is presented. 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<sup>2</sup> value is employed to validate the structural paths of the

**Table 2. Factor loadings, composite reliability and AVEs**

Constructs	Items	Factor Loadings	Composite Reliability	AVE
Perceived Usefulness (PU)	PU3	0.7788	0.819	0.532
	PU4	0.7872		
	PU5	0.7535		
	PU6	0.7610		
Perceived Ease of Use (PEU)	PEU1	0.7836	0.811	0.589
	PEU2	0.8082		
	PEU3	0.7562		
Attitude towards Use (ATU)	ATU1	0.7881	0.869	0.626
	ATU2	0.8134		
	ATU3	0.7626		
	ATU4	0.7985		
Competitors' Pressure (CP)	CP1	0.8560	0.895	0.740
	CP2	0.8731		
	CP3	0.8513		
Customers' Pressure (CsP)	CsP3	0.7688	0.839	0.637
	CsP4	0.8907		
	CsP5	0.7846		
Management Support (MS)	MS1	0.7911	0.888	0.613
	MS2	0.7629		
	MS3	0.8111		
	MS4	0.7975		
	MS5	0.7508		
Behavioral Intention (BI)	BI2	0.7832	0.861	0.610
	BI3	0.7824		
	BI4	0.8279		
	BI5	0.8297		

conceptual model. In addition, the t-statistics are calculated using the path coefficients of the constructs and their bootstrapped standard errors. The results dealing with the path coefficients, standard error and t-statistics are summarized in Table 4. The strength of the relationship is indicated by the  $\beta$  while the  $R^2$  highlights the percentage of variable in the model and gives an indication of its predictive power. The  $R^2$  value for green banking in this study is 0.3782. This means, the model explained 37.82% of the variance of the intention to adopt green banking by the central bank employees - which is fairly low. The path significance level (t-value) is also estimated by bootstrapping procedure and the Smart PLS 2.0 path modeling approach to test the structural paths of the proposed research model – following Ifinedo (2011).

Results of the study supports Hypothesis 1 and indicates that Perceived Usefulness (PU) has a significant influence on Attitude towards Use (ATU) of the central bank employees. This finding is consistent with Al-Smadi (2012) and Aboelmaged and Gebba (2013) and it implies that Bangladesh

Table 3. Measurement model estimations

	ICRs	ATU	BI	CP	CsP	MS	PEU	PU
ATU	0.815	<b>0.912</b>						
BI	0.809	0.545	<b>0.833</b>					
CP	0.884	0.567	0.443	<b>0.887</b>				
CsP	0.832	0.489	0.688	0.413	<b>0.890</b>			
MS	0.816	0.087	-0.145	0.030	0.078	<b>0.806</b>		
PEU	0.867	0.513	0.401	0.323	0.421	0.067	<b>0.844</b>	
PU	0.854	0.429	0.221	0.376	0.355	0.135	0.328	<b>0.898</b>

Notes:

1. ATU (Attitude towards Use); BI (Behavioral Intention); CP (Competitors' Pressure); CsP (Customers' Pressure); MS (Management Support); PEU (Perceived Ease of Use); PU (Perceived Usefulness).

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

Table 4. Structural properties of model

Hypothesis	Path Coefficients (P)	Standard Error (STERR)	t-Statistics (P/STERR)	Results
<b>H1:</b> Perceived Usefulness to Individual Attitude.	0.346	0.137	2.461**	Supported
<b>H2:</b> Perceived Ease of Use to Individual Attitude.	0.086	0.143	0.529	Not Supported
<b>H3:</b> Perceived Ease of Use to Perceived Usefulness.	0.567	0.087	6.349***	Supported
<b>H4:</b> Attitude towards Usage to Behavioral Intention.	- 0.017	0.117	0.180	Not supported
<b>H5:</b> Management Support to Behavioral Intention.	0.321	0.096	3.251***	Supported
<b>H6:</b> Competitors' Pressure to Behavioral Intention.	0.045	0.117	0.402	Not supported
<b>H7:</b> Customers' Pressure to Behavioral Intention.	0.356	0.114	2.985***	Supported

\*significant at \*\*P<0.05, \*\*\*P<0.005

Bank can make provision of banking services easier and have lower transition cost if their employees adopt green banking. It can also help the central bank to ensure more social and environmental responsibility in the financial sector by ethical investments and loans. This result further suggests that green banking has a notable and positive benefit for both individual and organizational-level performance. However, Hypothesis 2 has not been supported in this study. This indicates that Perceived Ease of Use (PEU) has a negative influence on Attitude towards Use (ATU) of the central bank employees. In line with Khanifar et al. (2012) and Aboelmaged and Gebba (2013), this result suggests that central bank does not spend enough time and money into the additional training of its employees for adopting green banking in Bangladesh. As such, employees confront difficulties while adopting green banking and thus a negative relationship surfaces in this case.

In contrast, Hypothesis 3 has been supported in this study. Results claim that Perceived Ease of Use (PEU) has a significant influence on Perceived Usefulness (PU). This proves that the Bangladesh Bank employees view the benefits of green banking based on the ease of use. Ease of use can be defined here in terms of time, effort and cost that are required by the employees to put in the adoption of green banking. This finding is also consistent to previous studies of Al-Smadi (2012)

and Medyawati et al. (2011). For Hypothesis 4, findings show that Attitude towards Use (ATU) has negative influence on Behavioral Intention (BI) of Bangladesh Bank employees. Although literature provides very less evidence in favor of this result, it is found consistent with Khanifar et al. (2012). It means that employees are not interested to adopt green banking in the central bank. This can be due to their perception that their prevailing banking method was more convenient, lack of awareness of relative advantages, lack of proficiency in technology, security and privacy issues, or distrust of the green banking channel in Bangladesh. Alternatively, Hypothesis 5 has been supported in this study, wherein Management Support (MS) have a positive influence on Behavioral Intention (BI) of Bangladesh Bank employees. This implies that top management of the central bank is able to realize the relevance of green banking and is working towards involving, motivating and engaging employees towards the acceptance of green banking in Bangladesh. As such, they require immense support from the bank employees in the adoption of green banking within the banking activities. Prior studies like Ifinedo (2011) and Ramdani et al. (2009) also affirm this finding of the current study.

On the other hand, results of the current study do not support Hypothesis 6. This indicates that Competitors' Pressure (CP) has a negative influence on Behavioral Intention (BI) of central bank employees. In Bangladesh, the Green Banking Policy has just come into action and other scheduled banks of the country are still working to cope with this new framework. For this reason, competitors' pressure has not been taken into consideration as having any impact on the central bank employees with regard to green banking adoption. This finding is very much in accordance to Martin et al. (2012) as well. Finally, a clear support can be observed for Hypothesis 7 in this study. Consistent with Ifinedo (2011), results show that Customers' Pressure (CsP) has a positive influence upon Behavioral Intention (BI) of central bank employees. Due to increased consciousness about environmental degradation, many customers advocate the use of green banking in all financing and investing activities of the banking sector, specially the central bank. Green banking adoption can therefore act as a competitive advantage for Bangladesh Bank if they want to attract a global clients' base in the country.

## DISCUSSION AND IMPLICATIONS

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 knowledge, there has been no significant study that investigates the influencing factors of green banking adoption, with central bank as the setting in Bangladesh. Therefore, this study will improve our understanding of this emerging phenomenon. It will also evoke academic investigations on the underlying mechanisms of bankers' intention to use green banking services in central banks. Next, this study highlights the role of stakeholders' interests like management and customer in explaining the bankers' adoption of green banking services in central bank. Moreover, facets of the technology acceptance model (TAM) like perceived usefulness and perceived ease of use based on the findings of Davis (1989) and Davis et al. (1989) are further facilitated in the conceptual model of this study. TAM advocates that the acceptance of technology by individuals typically depends upon the technology's level of usefulness and the effort needed to use it. In this regard, a new theoretical basis for future research on bankers' adoption of green banking as a form of technology as well as for any other technological services is provided.

This research has attempted to find the relevant factors that can influence the adoption of green banking among the employees of Bangladesh Bank. TAM framework along with the variables of customer and competitor pressure, and management support, has been used to develop this study. Findings of this study indicate that perceived ease of use has positive impact on perceived usefulness of green banking while customers' pressure and management support are significant predictors of green banking adoption for central bank employees. Competitors' pressure and attitude towards use, however, is found to be irrelevant for green banking adoption in this case. One significant observation here is that even though perceived usefulness has positive impact upon attitude towards use, but

perceived ease to use has adverse influence upon the same. For this reason, there prevails a lack of intention to adopt green banking among the central bank employees.

At this point, survey results give an impression that Bangladesh Bank employees actually opt for green banking as part of their in-house activities and external functions because of the mandated application of Green Banking Policy. This is a clear example of management support towards banking guidelines, since complying with policies and balancing inhibitions equals to providing support on part of employees. To add more, employment of green banking is often considered as an act of image resurrection and a result of stakeholder pressure. This is because the use of green banking helps to attract international customers to a large extent since being socially responsible is a concern for many global clients today. Thus, it can be rightly stated that customer pressure can be significant for green banking adoption among central bank employees as well. Findings of this study are mostly in line with the results reported by Ahmad et al. (2014), Masukujjaman et al. (2016) and Nisha (2016a). Ahmad et al. (2014) and Nisha (2016a) claim that policy guidelines of Green Banking and stakeholder pressure are two major influencing factors for bank employees to adopt green banking. While, Masukujjaman et al. (2016) state that employees accept green banking in both internal and external activities of the central bank as an act of image improvement, and due to the pressure from customers and stakeholders. At this point, it can be deduced that the attitude of central bank employees towards green banking is fairly unconvincing in Bangladesh. Hence, to facilitate greater acceptance of green banking and related services in Bangladesh Bank, the central bank governor should initiate training and mentoring to the bank employees. This can make them realize the ease of operating banking activities under green banking and increase their behavioral intention for adoption.

In the context of Bangladesh, the pragmatic attitude of employees towards the use of green banking approaches for in-house and external banking activities clearly indicates that employee awareness and motivation is required. This is specifically required in order to implement other forms of green investments within the central bank. The government and Bangladesh Bank should thus be more forthcoming in this regard by making budgetary allocations and provide more financing facilities for extensively implementing green investments. This is going to ultimately encourage other scheduled banks of the country to participate as well.

## **LIMITATIONS AND FUTURE RESEARCH DIRECTIONS**

The present study is solely based upon the green banking initiatives of the central bank of Bangladesh. As a result, the sample scale is small to go for the maximum possibility method that is accepted now as a better technique for connecting model testing. Future research can examine the forms of green banking activities adopted by the commercial or state-owned banks of the country and opt for a bigger sample size. A similar research can also be conducted for different developing countries to do a more in-depth analysis of green banking approaches. Moreover, the conceptual research model in this study did not consider the effects of regulatory pressure, earnings, size and age of bank employees as influencing factors. Future research can contemplate the inclusion of such moderator variables. In addition, this study has mainly emphasized on the assessment of the perceptions and attitudes of bank employees towards green banking. A longitudinal study can be adopted in future works to examine a different research model in order to examine the influencing factors of green banking from the perspective of bank clients. Comparative studies can even be conducted between customers and employees in terms of factors influencing their adoption decisions. This will provide a better insight into the perceptions of users and can help to enhance the understanding of individual users' intention to adopt green banking services in the context of Bangladesh.

## CONCLUSION

Currently, the central bank of Bangladesh is working relentlessly to apply green banking across its own branch as well as other scheduled banks of the country. The central bank therefore plays an intermediary role between economic development and environmental protection by promoting environmentally sustainability and socially responsible investments like green banking in Bangladesh. As such, interests of various stakeholders like management, customers and particularly employees are involved in this technological initiative. Since employees can bring forth innovation and digitalization in daily banking activities, it is necessary to train them and make them aware of the usefulness and ease of use of green banking. Moreover, top management and customers need to participate in such awareness programs as well to ensure employees that it is a common goal for all stakeholders alike. This step can reduce the pressure and inhibitions that employees are going through with the initiation of green banking in the central bank. As such, the adoption of green banking within the central bank can witness a dramatic shift in adoption rates in Bangladesh.

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