

INVESTIGATING THE CONSUMERS' PERCEPTION TOWARDS USAGE OF PLASTIC MONEY IN BANGLADESH: AN APPLICATION OF CONFIRMATORY FACTOR ANALYSIS

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ABSTRACT

Technology has drastically changed all the sectors including the financial sector, and the transactions in the banking system have also undergone a remarkable change. The traditional concept of payment through cash is replaced by the credit cards or the debit cards called 'plastic money' that people are using to draw money or to make purchases. This particular research focuses on the perception about the acceptance of plastic money, its usability and affordability while they are making an impact on its preference of use in Bangladesh. Data have been collected from 202 respondents using a semi-structured questionnaire covering students, government service holders, employees of private organizations, and businessman. It is found that most of the respondents are using plastic money usually for shopping and international purchases, and also for purchasing expensive products. In order to identify the latent variables regarding the perception of using plastic money, factor analysis has been incorporated. Factor analysis extracted three latent factors, namely, influential factor for using plastic money, beneficial factor of using plastic money, and problems in using plastic money. Confirmatory factor analysis has also been done in order to get the degree of effect of the observed variables on the extracted factors. And it is found that among the influential variables, people are mostly influenced for using plastic money because they think it adds value in their lifestyle. Secure transaction is the most beneficial reason of using plastic money according to the respondents. The problems of using plastic money as found through confirmatory factor analysis, are unavailability of money in ATM (Automated Teller Machine) booths, unavailability of technology of payment through plastic money in purchase points, and the technological complications faced by the card holders.

Keywords: Plastic Money, Credit Cards, Debit Cards, Factor Analysis, Confirmatory Factor Analysis, Bangladesh

Introduction

While credit cards have been introduced in developed countries decades ago, their introduction in the developing countries like Bangladesh is relatively new. With the advancement of technology, a dramatic shift in financial sector has been observed specially in the banking sector in Bangladesh. One of such remarkable additions in banking sector is "plastic money". The development of plastic money is probably one of the most significant phenomenons of the modern banking era, making huge impact on the financial sector. Now banks are providing online transaction facilities, bill payment facilities and so on. Here, the term 'plastic money' is used predominantly in reference to the hard plastic cards which is used in place of actual bank notes such as cash cards, credit cards, debit cards, pre-paid cash cards and store cards. Traditional system of payment through cash is gradually being replaced by these debit and credit cards. Banks are competing to attract customers to use this plastic money. They are trying to improve their credit/debit card services simultaneously. Preference of using plastic money by the customers is growing rapidly. Now a day's people do not prefer to carry cash with them; in lieu of that they like to keep cards in their wallets or in purses. Because carrying wads of cash for a weekly or monthly shopping is risky as there is a chance of losing money to thieves or hijackers and not having enough when one get to the payment counter is embarrassing. Plastic money seems to be a more convenient and safe option to customers as payment mode. Banks are introducing new services and new offers through these cards. Interestingly, customers who are habituated of using cards, do not feel comfortable or are not willing to purchase goods or services through cash. Apart from withdrawing money from an ATM or transacting at a Point of Sale (POS) in a retail market, plastic money brings with it enhanced security, portability, 24 hour accessibility to account balances, easy payment of monthly utility bills, transfer funds between accounts. In a developing country like Bangladesh, higher value purchases are increasingly being made through plastic money and customers get the opportunity to buy high value products in installments. With these immense benefits, plastic money is gradually becoming the major mode of transaction in Bangladesh. But still there are many limitations and problems prevail in terms of using plastic money, specially, in the context of Bangladesh. So, if the problems and the prospects that are facing by the ultimate users be known, that can be addressed and measures can be taken accordingly to improve. In that connotation, the study is an attempt to unveil the perception held by card users in Bangladesh. In the process, based on the responses of the plastic money users in Bangladesh, this study aimed to look into the perceptions of the respondents about usages of plastic money. 14 questions were asked to the respondents regarding to plastic money usage and an

exploratory factor analysis has been done to see whether there is any latent structure of the responses. Based on the extracted latent factors, it is found that the responses were clustered into three different groups. A rigorous investigation has done on the homogeneously clustered observed variables and found the factors are clustered as, influential variables, benefit related variables, and problem related variables. Based on that extracted factors, as an inferential technique, Confirmatory Factor Analysis (CFA) has also been performed. The objective of CFA was to see the significance and extent of importance of the observed variables on the extracted factors.

Evolution of Plastic Money in Bangladesh

The use of both credit and debit cards, are increasing gradually in Bangladesh as convenient and safe for various types of transactions. Credit card was introduced in Bangladesh in 1997 by a local bank, namely, National Bank who started issuing MasterCard branded credit card for both Local and International type (use of plastic money, 2015). Since the beginning NBL issued cards by imprinting and embossing few features on the imported plastic cards in its own house. This unique in house service enabled it to deliver the cards to its customers within 24 hours from the very beginning. At present, many banks in Bangladesh provide this facility: Standard Chartered Bank, National Credit & Commerce (NCC) Bank, Premier Bank, Prime Bank, Arab Bangladesh (AB) Bank, Dhaka Bank, Southeast Bank, National Bank, The City Bank, United Commercial Bank, Mercantile Bank, EXIM Bank, One Bank and Lanka Bangla. Currently, around 8.0 million debit cards are being used across the country. According to Bangladesh Bank data, people are using more credit cards issued by local private commercial banks than the foreign commercial banks, operating in Bangladesh. However, many credit cardholders in Bangladesh are non-active cardholders although a significant proportion of them might have more than one bank's credit card. Most of the local private commercial banks and foreign commercial banks issued credit cards in Bangladesh for both local and international market. But, none of the state-owned banks issued any credit cards yet, though some of them issued debit cards. The growth of credit cards has had an enormous impact on the buying habits of the consumers by making it much easier for them. Technological advances have facilitated the use of credit cards in Bangladesh. Credit card companies are also experimenting with smart cards that would act like a small computer storing account and other information necessary for its use. An alternative to credit card is the debit card, which is used to deduct the price of goods and services directly from the customers' bank balances (Shumi & Shafiullah, 2014).

Background of the Study

As said, use of credit / debit cards, is a relatively new phenomenon in Bangladesh, and its market has been growing rapidly with the increasing acceptability of plastic money in numerous outlets. Since credit card is a relatively new phenomenon in Bangladesh, a large number of people are not familiar with the advantages and different features of using a credit card. Use of credit card reduces the complexity of human life, and, therefore, credit card can play an important role in Bangladesh in improving people's living standard or lifestyle by easing the transactions of money in a convenient and secure way. With the advent of modern technology, a major change has taken place in the world of business that will also help to usher in cashless society. This rather quite change has involved the creation of a new form of currency "cards or plastic money" - as a substitute for traditional paper money and coins, and it has already altered totally the way the world does business as so in Bangladesh. Almost in every country around the globe, plastic money has created a new dimension in terms of transaction, service and so on. Every bank and financial organizations influence their prospects to get in touch with the plastic money. But, at the same time, the acceptance of this plastic money as an alternative of cash is still questionable in Bangladesh. It seems that the users of debit cards and/or credit cards are still very few in numbers and are confined within some specific classes or groups of people in Bangladesh. This particular research has been conducted to know more about the consumer behavior towards plastic money and the usage of plastic money as an alternative to cash. At the same time the factors affecting the perception of consumers toward plastic money have also been examined.

Research Objectives

General Objective

The general objective of this study is to investigate the customers' perception towards the usage of plastic money in Bangladesh.

Specific Objectives

Along with the general objective, some specific objectives will also be investigated. Those are as follows:

- to understand the influencing factors behind the use of plastic money
- to identify the benefits of using plastic money
- to assess the problems of using plastic money

Research Questions

Some research questions have also been formulated to be answered by the respondents; these are:

- What are the factors that influence people to use plastic money?
- What are the benefits of using plastic money?
- What are the problems of using plastic money?

Literature Review

Everywhere in the society, credit cards have become a fact of life for most of the consumers and a part of the consumers' culture. In USA, as of 2011, 77% of US adults owned at least one credit card and, in average, a card holder owns 7.7 credit cards (Mansfield, 2012). Now days, the professionals are not the only credit card users but the students are also a significant stakeholders of credit cards (Mansfield & Pinto, 2008; Robb & Sharpe, 2009). From the 1960s, consumer credit cards have become a topic of academic research. In the earlier stage the research works were mainly based on evolving the descriptive characteristics like number of cards and card users (Hirschman, 1979; Hirschman & Goldstucker, 1978; Plummer, 1971; Slocum & Mathews, 1970). The early literatures also began to provide insights from a consumer behavior perspective, such as consumer's attitude towards credit cards (Awh & Waters, 1974; Blackwell, Hawes, & Talarzyk, 1975). Manivannam (2013) studied on the conceptual framework of plastic money on the users and showed different factors that influence the people to hold the cards. The prospects and usability of plastic money is not same everywhere. People are reluctant to use plastic money in some countries like Pakistan, mostly because of misperceptions about the plastic money (Ullah *et al.*, 2014). Lack of education, poor banking systems, and insecurity of transactions are also the responsible factors for that reluctance. In another study, Soman & Cheema (2002) explained that propensity to spend increases as a function of the credit limit, especially, as credit limit increases, subject using a credit card report a higher likelihood of making a purchase, other things remaining constant. When a consumer once has a credit card and a credit line available, sometimes unnecessary spending gets unavoidable. Sometimes, gender and educational background also play role about holding and usages of plastic money (Kaseke, 2012). Hausman (2000) showed, the tendency of younger adults to seek fulfillment through hedonic activities such as shopping, hanging out, and high life styles by using credit cards. The habit of spending is largely controlled by the credit cards (Judge and Simon, 2009). The consumers generally don't hold sufficient cash to purchase anything; but they can use their cards to purchase. Plastic money like credit or debit cards are sometimes boon for the users and sometimes it is bane due to transactional costs and unnecessary formalities (Bisht *et al.* 2015). Due to excessive use, often the credit cards become a matter of concern for causing huge debt (Ladka, 2011 & Manning, 2000). Plastic money has a charismatic appeal as it has influential effect which is often endorsed by the family and friends (Subhani *et al.*, 2011; Nirmala & Sonu, 2015). With the proliferation of research around the world by different disciplines on consumer perceptions about plastic money, now it could be an interesting thing to know the perceptions of the people of Bangladesh about plastic money. Though some research have been carried out on the perceptions about the usage of plastic money those are predominantly descriptive rather than being analytical. A study conducted by Sumi & Safiullah (2014) only showed different problems and prospects of using plastic money in Bangladesh.

In the dearth of significant research works on plastic money in Bangladesh, the study has aimed to explore the perceptions of the users of plastic money about the factors that have motivated them to use plastic money over cash, and the benefits being enjoyed and the problem being faced by using plastic money.

Methodology

Data and Sample

The research design is qualitative in nature; primary data were collected from the target population by using semi-structured questionnaire. The target population for this study are the users of different kinds of plastic money, like, debit cards, credit cards, who actively use it in their day to day life. Data have been collected from the students, businessmen, Government employees, private organization employee, etc. from different areas of Bangladesh. Non-probability convenient sampling technique was adopted to select the respondents and, in the process, 202 respondents were interviewed, and their responses were recorded.

Variables Specifications

To know the consumer perception about plastic money, it is needed to know about the factors affecting consumer behavior to avail plastic money. The factors chosen for this study are broadly categorized as (1) the characteristics of the individual or "Characteristics of Buyer" (income, age, lifecycle), (2) the characteristics of credit card system or "Characteristics of Plastic Money System" (interest rate, prestige, billing practice), (3) the characteristics of the item being purchased or "Characteristics of Product" (price, size complexity), (4) the policies of the place of purchase regarding acceptable payment system or "Characteristics of Seller", (5) characteristics of the situation in which the transactions take place or "Characteristics of Situation" (time pressure, outstanding debt, degree of necessities).

Methods

Reliability of the data set has been tested through Chronback's Alpha, by measuring the internal consistency of the responses.

Exploratory Factor Analysis

Factor analysis attempts to identify underlying variables, or factors, that explain the pattern of correlations or covariance within a set of observed variables. In this study, to identify the hidden structure of the responses regarding the usages of plastic money, exploratory factor analysis has been done. Another purpose of using the exploratory factor analysis is to reduce the dimension of data by identifying a small number of factors and the extracted factors have the parsimony of retaining sufficient variation of the observed variables.

Confirmatory Factor Analysis (CFA)

Once the structure of the reduced factors are known by the exploratory factor analysis then to get the idea about the effect of each of the observed variables on the extracted factor the Confirmatory Factor Analysis (CFA) is being used. In this study, we also used the inferential CFA to estimate the effect of the observed variables on the estimated latent factors.

Testing the Goodness of Fit of the CFA

The most widely used measure of model fit is the chi-square statistic (Judge & Simon, 2009). Bentler (1990) further suggested a combination of standardized root-mean-square residual (RMSE) and the comparative fit index (CFI). In this study, we also reported the root-mean-square error of approximation (RMSEA; Maccallum, Browne, & Cai, 2006) and the normed fit index (NFI; MacCallum, Roznowski, Mar, & Reith, 1994). Finally, the Akaike Information Criterion (AIC; Akaike, 1987) has also reported because it is useful for model comparison (Tanaka, 1993). AIC is useful to find the parsimonious model. As Mulaik, James, and Van Alstine (1989) noted, the AIC penalizes a model for losses in degrees of freedom resulting from the estimation of more parameters, when comparing models according to their lack of fit to the data.

Results and Discussion

Among the respondents 62% are male and the respondents are holding graduation (52%), post-graduation (38%), and other professionals (9%) degrees. Most of the respondents are students (48%) followed by private job employee (38%), businessmen (7%), and government employees (appendix table 1). In the age pattern of the respondents, it is found that most of them are in the age group 21 to 30 years and the second highest, 39 respondents are found in the age group 31 to 40 years (Figure 2). It is found that respondents use their plastic money for shopping mostly (78.7%), beside that the others usages of plastic money are restaurants (8.9%), travel (9.4%), hotel (2.5%), and sometimes for payment in hospital (Figure 1). About 75% of the respondents replied that using plastic money has brought change in their monthly expenditure (Appendix table 2).

Figure 1: Distribution of usage of plastic money of the respondents

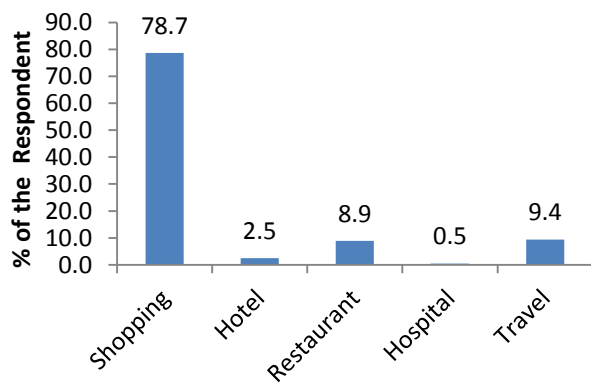
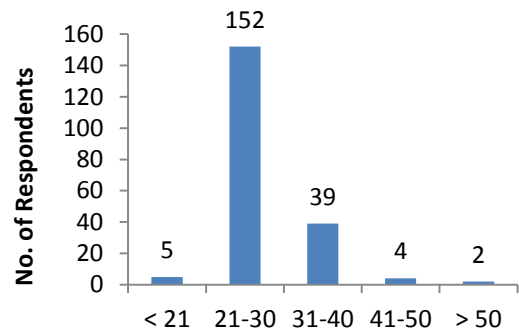


Figure 2: Age distribution of the respondents



Respondents were asked 15 questions regarding their perceptions about using plastic money. Responses were recorded in a 7-point Likert scale; from strongly disagree to strongly agree. The descriptive summary of the responses are as follows:

Table1: Descriptive Findings about the Responses on the Study Variables

Statements regarding perception of using plastic money	Mean	SD	N
Using plastic money is prestigious	4.61	1.84	202
Adds value to your lifestyle	5.00	1.73	202
Purchase complex products (e.g. international purchase)	5.41	1.81	202
Use more while purchasing high price products	4.99	1.76	202
Purchasing products in a bulk amount or when the product size is huge	4.69	1.66	202
Technology of using plastic money is available everywhere	3.62	1.90	202
Interest rate of the credit card is reasonable	3.11	1.70	202
Billing through plastic money is more convenient	4.97	1.57	202
Plastic Money users get extensive benefits for selective purchases	4.82	1.62	202
Payment through plastic money reduces the time pressure	5.08	1.72	202
Plastic Money is a more secure way of transaction	5.34	1.80	202

Non availability of cash in ATM booths	4.76	1.71	202
Non availability of Technology of payment through plastic money at purchase points	4.83	1.74	202
Fake Notes from ATM booths	4.05	1.83	202
Technological Complications	4.59	1.78	202

The findings of the descriptive statistics suggested that adding value to the lifestyle, secure transaction, time effectiveness are the leading reasons of using plastic money, on the contrary, interest rate, technological non availability and complicity, and likelihood of getting fake notes are the dissatisfactory causes that people are facing while using plastic money in Bangladesh. The lower standard deviation (SD) values regarding responses indicate the homogeneous pattern of responses of the respondents.

Reliability Analysis

The reliability of data has been confirmed by Cronbach’s Alpha (0.90), indicating the high internal consistency of the responses.

Factor Analysis

The relevancy of factor analysis has been ensured through Kaiser-Meyer-Olkin (KMO) test, KMO=0.89, which indicates the suitability of factor analysis using these data. Also the significance (p-value=0.000) of the Bartlett’s test indicate that factor analysis might be a useful tool to explore the hidden structure of this data set.

Upon completion of all relevant analysis, the final component matrix has been prepared, consisting of 3 latent factors, explaining sufficient variation of the observed variables. By studying the nature of the highly correlated observed variables with the extracted factors, it is being concluded that these extracted latent factors can be named, F₁ as influential factor, F₂ as beneficial factor, and F₃ as perception regarding the problems of using plastic money.

Table2: Rotated Component Matrix Solution for 3-factor Solution

Observed variables	Latent Factors		
	F ₁	F ₂	F ₃
Using plastic money is prestigious	0.71		
It can add value in lifestyle	0.78		
It ease complex purchase	0.75		
Useful for purchasing high price products	0.79		
Convenient for purchasing huge size products	0.65		
Available technology			0.74
Reasonable Interest rate			0.77
Convenient way of billing			0.57
Extensive benefits on selective purchases			0.53
Secure transaction			0.54
Non availability of cash in ATM booths		0.78	
Non availability of Technology at purchase points		0.74	
Fake Notes from ATM booths		0.79	
Technological Complications		0.77	
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			

Confirmatory Factor Analysis

After getting a good idea about the structure of the extracted factors and thereafter naming them, the Confirmatory Factor Analysis (CFA) technique has been adopted to specify which variables load onto which factor. The relation of the variables with the latent factor then can be established directly through structural equation model.

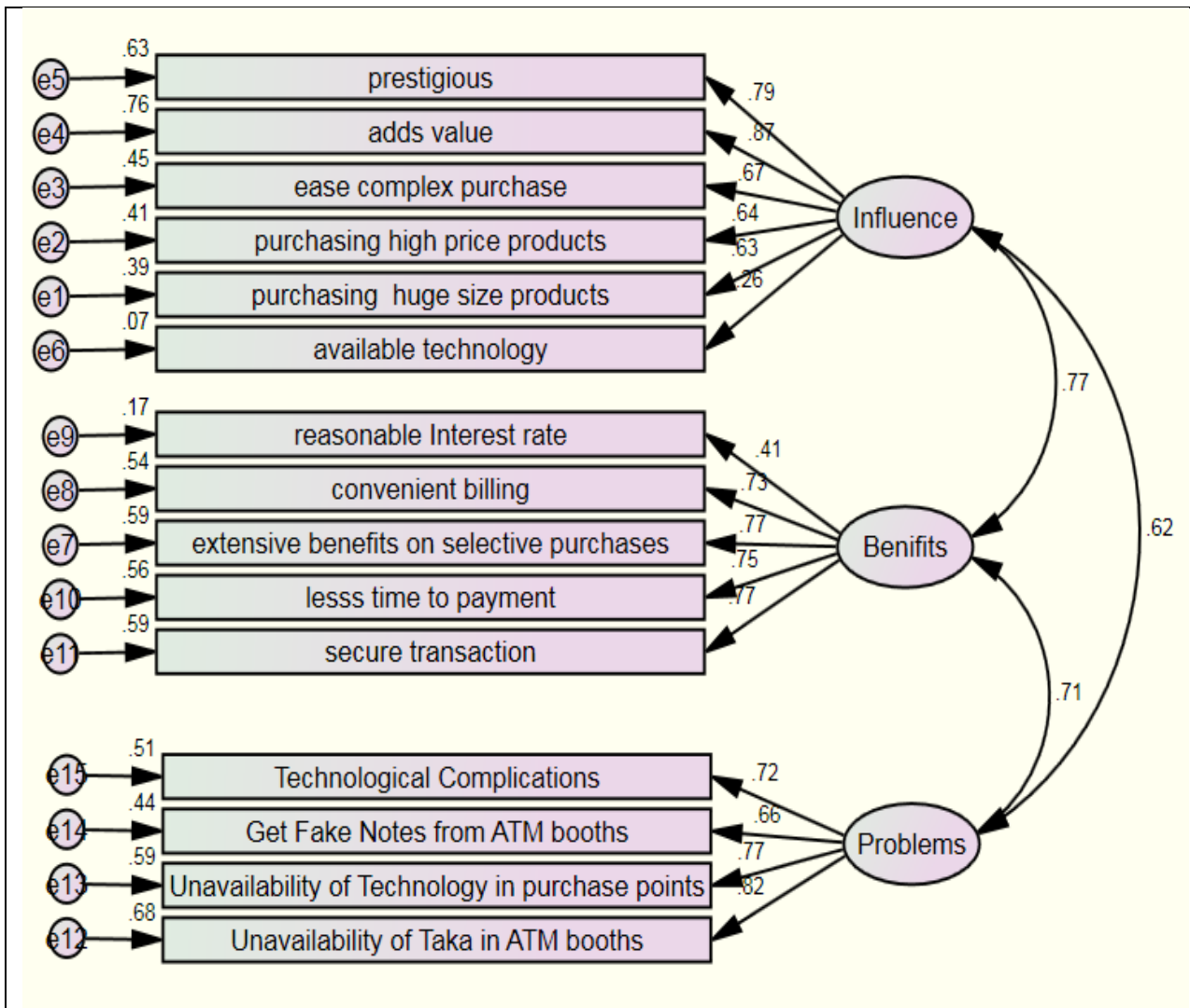


Figure3: Confirmatory factor analysis output through path diagram

The loadings associated with each of the variables with the latent factor indicate the amount of variation explained by them; and the correlations among the latent factors indicate the nature of linear changes with the change of other variables. Among the influential variables, value addition to lifestyle shows the highest loading meaning that people are mostly influenced to use plastic money by this issue and people also think that using plastic money is a prestigious issue which also influences them to use it. People are also motivated to use plastic money by the reason of its ease of complex purchase followed by purchasing products in a bulk amount or when the product size is huge and technological availability. The most beneficial reason to use the plastic money is its secure transaction process, and it has extensive benefits on some selective products. People are also using plastic money since it reduces the time of payment and the way of billing is convenient to them. Non availability of cash in the ATM booths and non availability of technology for payment through plastic money in purchase points are the leading hindrances according the respondents. Technological complications and fake notes from the ATM booths are also identified as the problems regarding using the plastic money in Bangladesh.

The co-variance between influential factor and beneficial factor is 0.77, indicating a positive strong nature of linear increment, whereas it is 0.71, between beneficial and problematic factor.

Table 3: Maximum Likelihood Regression Estimate for the Path Coefficients

Statements regarding perceptions	<--Factors	Intercept	β	S.E.	P
Helpful to purchase huge amount products	<--- Influence	4.68	0.62	0.117	***
Helpful for purchasing expensive products	<--- Influence	4.98	0.63	0.124	***
Helpful in case of international purchase	<--- Influence	5.41	0.67	0.127	***
It adds value to lifestyle	<--- Influence	4.99	0.87	0.121	***
Using plastic money is Prestigious	<--- Influence	4.60	0.79	0.129	***
Plastic money is availability	<--- Influence	3.61	0.25	0.134	***

Statements regarding perceptions	<--Factors	Intercept	β	S.E.	P
Using plastic money is time effective	<--- Benefits	5.08	0.75	0.121	***
Preference over selective purchase	<--- Benefits	4.81	0.76	0.114	***
Convenient to bill payment	<--- Benefits	4.97	0.73	0.111	***
Interest rate is reasonable	<--- Benefits	3.11	0.41	0.120	***
It is a secure way of Transaction	<--- Benefits	5.34	0.76	0.126	***
Getting fake notes from ATM	<--- Problems	4.05	0.66	0.128	***
Unavailability of technology	<--- Problems	4.82	0.76	0.122	***
Unavailability of money in ATM	<--- Problems	4.75	0.82	0.120	***
Technological complications	<--- Problems	4.59	0.71	0.125	***

From the regression output, it is clear that all observed variables have significant effect on the latent factors that exert the relevance of the observed-latent relationship. And the findings suggested that among the influential factors people strongly agreed that in case of international purchase they are getting benefitted that influence them to use plastic money. Besides these many of the respondents think using credit/debit cards is a prestigious matter and in the process it adds value to their lifestyle. In response to the questions of available technology of plastic money, people were reluctant to agree; rather they have identified it as a problem prevails in Bangladesh, which acts as a hindrance to the availability of plastic money. The perceived benefits of using plastic money are its time effectiveness and convenience of paying bill along with special emphasize on its secure transaction role. From the responses regarding the statement of interest rate of using plastic money it is clear that the interest rate is high. The prevailing complicacy of using plastic money is the non availability of technology at the purchase points. Some technological complicacies are also evident, which may be because of lack of knowledge of the card holders in this aspect. People are aware of getting counterfeit notes from the ATM booths that they have identified as a problem of using plastic money in Bangladesh. From the findings it can be concluded that plastic money has got some pull factors to attract its prospective customers as well as playing role as a beneficial medium of exchange; but still there are issues making troublesome situation for the users.

Covariance and Correlation Structure Analysis of the Latent Factors

Latent variables relations	Covariance	Correlation
Influence <--> Benefits	1.037	0.77
Problems <--> Influence	0.783	0.62
Problems <--> Benefits	1.112	0.71

It is found that latent factors are bi-directionally significantly correlated. Highest covariance has been found between problems and benefits.

Goodness of Fit of CFA

The goodness of the fit of the estimated model has been ensured through the following goodness fit parameters.

Fit Indices	Measurement
GFI	0.86
AGFI	0.81
NFI	0.84
IFI	0.90
CFI	0.90
PCFI	0.75
AIC	321
RMSEA	0.08

All goodness of fit indices indicates the goodness of fit of the estimated model. The higher the value of Goodness of Fit Index (GFI), better the goodness of fit of the estimated model. The Adjusted Goodness of Fit Index (AGFI) is sufficiently large, ensuring again the goodness of fit of the model. The Normed Fit Index (NFI) is also large enough to ensure the goodness of fit. Incremental Fit Index (IFI) is 0.90 which is well enough to fit a valid model. Comparative Fit Index (CFI) is also close to one, indicating the goodness of the fit the estimated model. The Root Mean Square Error of Approximation (RMSEA) is less than 0.1, which is a good notion of better predictability of the fitted model.

Conclusion and Recommendation

Based on the findings of the exploratory factor analysis and confirmatory factor analysis from the responses of the respondents, it can be said that the perception regarding usage of plastic money is broadly persuaded by 3 factors, namely, influential factors, beneficial factors, and the problems of using plastic money. The findings suggested that the use of plastic money has got both pros and cons. The users are thinking that using of plastic money is prestigious and it adds value to their lifestyle. Moreover, it is the secure way of transactions to purchase some specific products, plastic money has got preference subject to its better usability,

and payment through cards is convenient over cash payment. But still there are some hindrances that people are facing while using plastic money in Bangladesh, like, high interest rate, technological non availability etc. that need to be taken care of to get the full benefits of plastic money.

Limitation and Further Research Direction

This study has been conducted on specified types of respondents. To generalize the results and suggestions for better degree of accuracy and dimensions, this study can be done in a wider extent, like, considering other stakeholders of plastic money.

Appendix

Appendix Table 1: Distribution of occupation of the respondents

Types of respondents	Frequency	Percent
Student	96	47.5
Government employee	4	2.0
Private employee	77	38.1
Businessmen	11	5.4
Others	14	6.9
Total	202	100.0

Appendix Table 2: Changes in monthly expenditure due to the use of plastic money

Monthly expenditure pattern	Frequency	Percent
Increased	151	74.8
Not Changed	51	25.2
Total	202	100.0

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