A study on customer satisfaction on debit cards: The case of Vietnam

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CHRONICLE	ABSTRACT
	This research is conducted to examine the determinants of customer satisfaction in using debit cards issued by the Vietnam commercial banks (CB). By applying the exploratory factor analysis (EFA), logistic regression and linear regression on a dataset of 428 customers, we find that the features and price of products were the key determinants influencing the frequency of using debit cards. However, the impact of each determinant is heterogeneous among different groups of customers. Product price and features are more likely to influence the users using debit cards to purchase goods or services in stores or online than customers working for the public agencies or frequently using non-cash payment for high-valued transaction. © 2020 by the authors; license Growing Science, Canada.

1. Introduction

This study is conducted to meet two theoretical and practical needs. *First, despite the rapid growth of payment services via debit cards offered by Vietnamese commercial banks, the quality of these services does not meet the clients' expectation.* Recently, the number of complaints and inconvenience to customers about debit card services tend to increase. This has resulted in breaking customer loyalty and then switch service providers. Customer dissatisfaction may arise from the shortage and uneven allocation of point of sales (POS), high fee, inadequate and unprofessional customer services (Truong & Phan, 2017; Oliver, 1980). In fact, debit cards are mainly utilized for money withdrawal rather than online, POS or ATM payments. According to the World Bank, Vietnam has the lowest rate of non-cash transactions in the region at 4.9% in comparison with 26.1%, 59.7% and 89.0% in China, Thailand and Malaysia, respectively. Furthermore, customer dissatisfaction and frequent switch on card providers lead to a large number of inactive cards and low card payment turnover. A report by Ernst & Young in 2014 showed that 65% of Vietnamese customers were willing to change financial service providers. Although ATMs have accounted for more than 90% of total bank-issued cards, there have been only 77 million active cards, along with 55 million unused cards. This situation makes bank hardly increase their card payment turnover and suffer more costs to keep track and maintain cash transactions at

ATMs. Due to the significant importance of non-interest revenue to bank efficiency (Nguyen, 2017), Vietnamese commercial banks must continue to aim to increase the popularity of card payment and limit cash transaction in the economy.

Second, previous studies have demonstrated the positive relationship between service quality and customer satisfaction (for example Tran & Bui 2013, Tran & Pham 2013, Chu 2014). Generally, earlier studies have considered quality in banking services as "how well the service delivered meets customers' needs". To measure customer satisfaction as well as the linking quality, satisfaction and loyalty in banking services, they either applied the original models of service quality or adjusted some of dimensions of those models in the context of Vietnam. Yet, their findings have contributed to rather than providing implications for banks to make final service decision because data concerning customer's assessment was not completely mined by those researches.

This research focuses on answering the following questions: (i) What are the drivers behind the customer satisfaction and dissatisfaction with debit card services? (ii) How do these determinants affect the choice and usage of debit card holders among different groups? In order to address the questions, we apply another scale to measure service quality which was more familiar with banking services than other scales. We rely on the primary data that was collected from interviewing a survey sample of 428 customers residing in Hanoi-the capital of Vietnam. Thus, findings discovered from analysis are more thorough than that of other researches.

2. Literature review

Service quality has been defined obviously by different authors. For example, Olivier (1993), Zeitham (1988) define service quality as a global judgment relating to the superiority of the service provided over customer expectations. Specifically, service quality is referred to as the difference between customer expectations of "what they want" and their perceptions of "what they get" (Brown & Swartz, 1989; Parasuraman et al., 1985, 1988; Teas, 1993). Based on varied conceptualizations, alternative scales have been proposed for service quality measurement. For instance, Lehtinen & Lehtinen (1982) highlight that the quality of service as perceived by customers has two dimensions including (i) process of service act (i.e., the manner in which service is delivered) and (ii) the outcome of service act (i.e., what the customers receive from the service).

On the other hand, service providers should demonstrate the ability to deliver and exceed customer expectations not only with how they deliver the services (functional quality), but also with what they deliver (technical quality) and these quality categories may influence customers' image of the service providers (Gronroos, 1984, 2001). Parasuraman (1985, 1988) emphasize that there are five dimensions used to evaluate service quality, including (i) Tangibles (representing physical facilities, equipment, and appearance of personnel), (ii) Reliability (representing ability to perform the promised service dependably and accurately), (iii) Responsiveness (representing the willingness to help customers and provide prompt service, (iv) Assurance (representing the knowledge and courtesy of employees and they ability to inspire trust and confidence, and (v) Empathy (representing caring, individualized attention the firm provide its customers).

For measuring the quality of electronic payment service conducted by banks, Humphrey et al. (1996) used four dimensions including output price, infrastructure, safety and financial strength of banks. Using research simple of banks in 14 developing countries, the authors find that banks should be interested in price policies (including fee and interest rates), infrastructure investment (in POS, ATM, etc.) in order to improve their electronic payment services. In later years, Boeschoten (1998), Humphrey et al. (2001) add dimensions of Transaction features, including transaction process, transaction time length and the interaction between bank officers and their customers, particularly in dealing with customer's complaints about banking services. A study on electronic banking by Baskar & Ramesh (2010) in India finds that the online customer service quality, online information system quality and banking service product quality significantly and positively influence the customer

satisfaction. Parasuraman et al. (1994) illustrate the need of customer expectation as measured by a comparative standard to evaluate service quality. The aim of increasing service quality is to enhance customer's perceptions in line with their expectations, then eventually to strengthen customer satisfaction. Moreover, this was approved to promote customers repeat patronage (Dick & Basu, 1994). They describe loyalty as the strength of the relationship between a customer's relative attitude and repeat patronage and found out four following categories of loyalty due to above relationship. Service providers should pay attention to the group of spurious - loyalty customers who are less likely to rebuy the service in the case of their willingness to seek better services that exceed their inertia (Gounaris & Stathakopoulos, 2004). Thus, it is necessary to meet most of customer expectations rather than their current perceptions in order to make them to consistently repeat their repurchasing behaviors (Parasuraman et al., 1994).

3. Research methodology

3.1. Research design

Following Parasuraman et al. (1994), the research structure consists of two stages as below:

Stage 1:
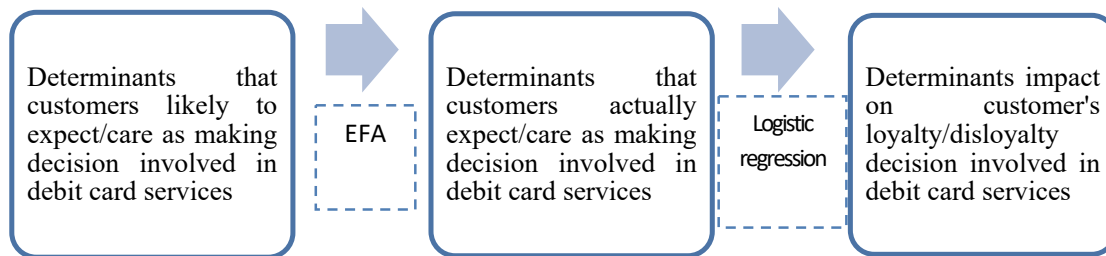
Stage 2:
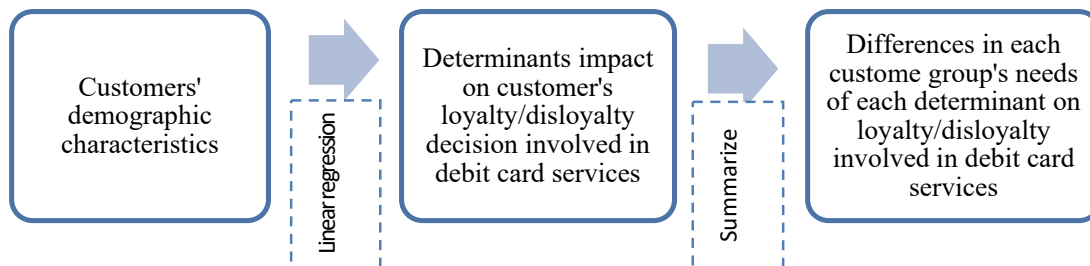
Note: This exhibit indicates steps to solve research questions

Fig. 1. Research Structure

In stage 1, we identify customer expectations and determinants of customer satisfaction in debit card services provided by CBs. According to SERVQUAL model raised by Parasuraman et al. (1985, 1988), determinants that customers are likely to expect or care are chosen and then modified due to approach of Fornell (1992). Thus, determinants that are initially considered to make debit card holding decision consist of Service features, Price, Brand Image and Interaction. Each factor is selected from previous researches. Al-Eisa and Alhemoud (2009), Jamal and Naser (2002) highlight that customers care for procedures (referred to as progression of service delivery), time of service delivery, product diversification, the distance between service providers and customers and service price. Matzler et al. (2006), Varki and Colgate (2001), Seyedaliakbara et al. (2016) illustrate the vital effect of price on

customer perceptions. Levesque et al. (1996) divide prices of banking service into three categories such as nominal interest rate written on the contract, negotiated interest rate except from nominal interest rate or fees and penalty interest rate as breaching the agreement. Besides, firm's brand image was found to directly influence service quality according to customers (Nguyen & LeBlanc, 1998). Bank's brand image that is widely known and loved is likely to positively affect customer perceptions toward its services (Che-Ha & Hashim, 2007). Last but not least, the fourth factor is the interaction between bank officers and its customers, which represents equipment and facilities (Barber & Scarcelli, 2010), the appearance of officers (Reimer & Kuehn, 2005), attitude and advisory capacity (Jamal & Naser, 2002). After providing services, customer care services such as expressing bank's deep gratitude to existing customers, sending emails to customers regularly with useful information, etc. are proved to promote customer sympathy (Ennew & Binks, 1999).

In stage 2, data of customer demographics (expressed on the top of the questionnaire) is coded. Then, we use a linear regression model to analyze the relationship between the mentioned coded demographic variables and significant determinants found in the first stage to examine the differences between each customer group's need and each feature involved in loyalty or disloyalty decision in debit card services. The purpose of this stage is to learn more about different groups of customers, then recognize the target customer group and propose appropriate plans to take care of them (Şchiopu, 2010; Nguyen, 2019). Many demographic variables such as gender, age, education level, marital status, income were showed the impact on customer behavior (Farokhi et al., 2016; Negeri, 2017).

3.2. Research sample

This paper uses a random sample encompassing 428 customers whose debit cards are issued by CBs located in Hanoi, Vietnam. This sample size is adequate for conducting EFA and multiple regression (Tabachnick & Fidell, 2007).

457 written survey questionnaires for gathering information were filled out directly by customers over the period from December 2016 to June 2017. There were 428 responses meeting the requirement. The survey questionnaire included 3 main parts: (i) customer information, (ii) Assessment the level of importance of 23 determinants in making decision of using debit cards and (iii) customer's future decision of using debit cards. The second part uses the Likert scale with five-point scale that allows the respondents to express how important they assess each factor.

3.3. Processing techniques

We analyze data through the descriptive statistics, exploratory factor analysis (EFA), and binary logistic regression with SPSS 22. This study employs the Kaiser – Meyer – Olkin, the Bartlett's test, the Total variance Explained, Loading Factor (in Rotated Component Matrix), and Cronbach Alpha to measure the adequacy and reliability of scales shown in Table 1. After that, we acquire FAC as independent variable in Logistic Regression.

The Binary Logistic Regression model is given as below:

$$Log\ (p/1-p) = \alpha + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n \tag{1}$$

where: p denotes the probability of the event that customers increase their frequency of using debit card. X_1, X_2... X_n represent FACs found after EFA. In order to assess the Logistic model fit, we test -2 Log likelihood indicator, sig. in Hosmer and Lemeshow Test. The Linear Regression model is given as below:

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + e_i \tag{2}$$

where: Y_i refers to as a significant FAC_i found through Logistic model. X_1, X_2... X_n represent variables described in Table 2. e_i refers to as a random error. In order to assess the model reliability, the value of R square and the value of Durbin Watson were used.

Variables

Stage 1: The dependent variable is Loyalty that takes the value of 1 if customers increase their frequency of using debit card and 0 otherwise. The underlying factor includes 23 determinants that customers may appreciate as making debit card using decision.

Table 1
Underlying determinants in research model in stage 1

Scales	Items	Definition
Service features	Products	The diversity of debit card products
	Procedures	Procedures the customers have to fulfill to active debit card
	Balance	Bank's requirement of minimum balance on debit card account
	Process	The ease of payment transactions
	Convenience	The varied convenience provided by bank
	Money safety	The security of money on the account
	Money availability	The availability of money in the ATM
	Privacy security	The security of card holder's personal information
	Account security	The security of card holder's account
	Network	The point – of - sale network
	Promotion	The diversify and attraction of promotion programs
Brand image	Reputation	Bank has acquired high reputation
	Fame	Many customers have known bank's brand image
Price	Opening fees	Banks charge fees to open card
	Transaction fees	Banks charge fees to make transactions
	Interest rate	Interest rate that card holder earns on deposit balance account
Interaction	Product advice	Bank officer's advice on using products
	Opening card advice	Bank officer's advice and assistance on opening card
	Attitude	Bank officer's attitude in solving card problems
	Solving time	Time spent on solving card problems
	Care	The bank's policy of caring customers
	ATM	ATM appearance and position
	Branches	Bank branch appearance and position

Note: This table describes underlying variables that are likely to be concerned by customers as they make debit card using decision. These variables were collected from previous researches.

Stage 2: The dependent variables are those correlated with Customer Loyalty explored in stage 1. The independent variables stem from 17 demographic characteristics of customer, then form 44 dummy variables expressed as below:

Table 2
Demographic variables employed in stage 2

Variables	Value
Gender	Dummy (D) = 1 if customers are male; D = 0 if customers are female.
Occupation	D = 1 if customers are students, running business, doing the housework, public servants; D = 0 otherwise.
Income	D = 1 if monthly income stands "less than 5 million VND", "from 5 to less than 10 million VND"; D = 0 otherwise
Age	D = 1 if the age of customers is under 30 years old; D = 0 otherwise
Education	D = 1 if customers hold a bachelor or master or doctoral degree; D = 0 otherwise
Technology preference	D = 1 if "technology preference"; D = 0 if vice versa
Bank	D = 1 if "BIDV"; "Vietinbank"; "Agribank"; "Vietcombank", "DongAbank"; D = 0 otherwise
Time	D = 1 if "under 1 year", "from 1 to 3 years"; D = 0 otherwise
Purpose	D = 1 if "cash withdrawal", "pay for goods and services at stores", "online shopping", "check real time balance"; D = 0 otherwise
Frequency	D = 1 if "pay for goods and services with card more than that in cash", D = 0 if vice versa
Payment value	D = 1 if "the total payment value with card more than that in cash"; D = 0 if vice versa
Card preference	D = 1 if "prefer card to cash"; D = 0 if vice versa
Provider change	D = 1 if "readily change provider aiming at paying with card instead of paying in cash"; D = 0 if vice versa
Reasons to choose bank	D = 1 if "family members' bank", "good reputation", "spreading point of sale network", "efficient customer service", "a wide variety of promotion programs", "competitive price policy"; D = 0 otherwise
Channels to know bank card	D = 1 if "traditional mass media such as television, newspaper, etc.", "modern mass media such as social networks, electronic media, etc.", "advertisement/leaflets", "acquaintances, friends", "being bank's existing customer"; D = 0
Viewpoint of card	D = 1 if "safe place for money", "comfortable place for money", "easy for payments", "style of person having high technology preference"; D = 0 otherwise
Awareness of card	D = 1 if card refers to as "level", "personality", "unimportance"; D = 0 otherwise

Note: This table describes the ways we used to code demographic variables of survey sample. These variables are expected to correlate with determinants that influence on customer loyalty in debit card services.

4. Results and Discussion

4.1. Findings in stage 1

Descriptive statistics

The descriptive statistics of the importance score of underlying determinants are shown in Table 3. Determinants which customers pay more attention than others carry the value of mean greater than 4.2 including Privacy Security, Account Security, Money Safety, and Money Availability. Due to the fact that account fraud has rapidly increased in recent years in both big and small Vietnamese banks, customers concern about the service security.

Table 3
Mean of underlying determinants

Items	Mean	Variance	Items	Mean	Variance
Product	3.251	0.8884	Reputation	3.932	0.8378
Procedures	3.557	0.8549	Fame	3.756	0.7942
Balance	3.405	0.8033	Opening fees	3.782	0.8541
Process	3.822	0.7544	Transaction fees	3.956	0.9040
Convenience	3.913	0.8219	Interest rate	3.679	0.9605
Money safety	4.321	0.8434	Product advice	3.632	0.8437
Money availability	4.253	0.8916	Opening card advice	3.656	0.7878
Privacy security	4.492	0.7853	Attitude	3.937	0.7526
Account security	4.525	0.7545	Problem solving time	4.061	0.7544
Network	4.143	0.7604	Care	3.803	0.7498
Promotion	3.426	0.8370	ATM	3.698	0.7752
			Branches	3.604	0.7723

Note: This table expresses the descriptive statistics of each question in the questionnaire. Due to 5 - point Likert scale, the value of mean in 2.61 – 3.4 represents the respondents do not reveal their opinions about issue received (also called neutral). The value in 4.21-5 represents the maximum respect (strongly important).

Validity and reliability tests of scales

Conducting EFA of 23 items projected respected by customers as making debit card using decision, we found out that sample sufficiency index KMO is 0.838 (greater than 0.5). Sig. value in Bartlett test is 0.000 (smaller than 0.05) for Approx. Consequently, factor analysis is reasonable and variables are correlated in the overall (shown in Appendix No. 1).

Total variance explained is 65.845% (greater than 50%), which indicates that the new five determinants together account for 65.845% of the total variance. The result from the matrix of the rotated factor loadings shows that 22 items of 23 original items are grouped into new 5 groups and all items having factor loadings greater than 0.5. This ensures that these items are practical significance (see Appendix No. 1). The "Promotion" item is removed because its factor loading is below 0.5, which is consistent with the context of Vietnam. Debit card promotions that have been conducted by Vietnamese banks mainly focus on paying no fee as open card firstly and receiving discount rates for taking card payments. The popularity of the free charge for first time users makes this benefit to be considered customer's apparent right. Many of discount promotions are thanks to with the partnership between card providers and businesses such as shops, restaurants, hotels, beauty salons, resorts, etc. Cardholders also receive many types of vouchers in the events of bank's birthday, customer's birthday, opening ceremony, etc. Cardholders only get this benefit in the case of they buy other goods or services supplied by bank's partners in the alliance. Thus, this promotion program sometimes is not attractive to customers. Hence, they might not consider Promotion item as important item when they make decision to hold debit card.

Looking at the table labeled Rotated Component Matrix, from 23 underlying items, after deleting Promotion item, the rest of 22 items is grouped into 5 categories (named FAC 1, FAC 2, FAC 3, FAC 4 and FAC 5 respectively). For a measure of scale reliability with Cronbach's alpha for 5 above FAC, the results are 0,875; 0,866; 0,732; 0,645 and 0,823 respectively (see Appendix No. 1). Having alpha coefficient below 0.7, FAC 4, composed of Products, Balance and Procedures, is unacceptable (Kline,

1998). This finding is consistent with the context of Vietnam. According to our previous research, debit cardholders recently have generally accepted Vietnamese banks' regulation of the minimum balances in the deposit account, steps need to complete for holding card and the diversify of card products. Cardholders score these items at 3.44; 3.56 and 3.37 respectively (Truong & Phan, 2017). The relative similarly in those items among Vietnamese banks results in having no impact on provider choice of customers. After EFA, there are 19 determinants (in 4 groups) showing that cardholders pay attention to as making debit card using decision (shown in Table 4).

Table 4
Lists of determinants that cardholders pay attention to as making decisions on using debit cards offered by banks

Factor groups	Items	Factor loading	Factor groups	Items	Factor loading
FAC 1	Opening card advice	0.870	FAC 2	Money safety	0.852
	Attitude	0.861		Privacy security	0.849
	Care	0.810		Account security	0.822
	Product advice	0.806		Money availability	0.693
	Problem solving time	0.801		Process	0.610
	ATM	0.677		Network	0.598
	Branches	0.650		Convenience	0.592
FAC 3	Fame	0.824	FAC 5	Transaction fees	0.784
	Reputation	0.800		Interest rate	0.746
				Opening fees	0.511

Note: This table summarizes factor groups that have influence customer's decision on making payments by debit cards after EFA and conducting the validity and reliability tests of scales.

Results from Logistic regression analysis

Applying Logistic regression technique to 4 factor groups found above and Overall Customer Loyalty, the value of -2 Log likelihood is 270.200 indicating the close relation among variables in the model. The value of sig. in Hosmer and Lemeshow Test is 0.007 (< 0.05) showing the model fit well the data (see in Appendix No. 2). Table 5 shows the Logistic regression results.

Table 5
The relationship between Determinants Groups and Customer Loyalty Involved in Using Debit Cards

Independent variables	Estimates
FAC 1	0.173 (0.167)
FAC 2	0.432 (0.137)***
FAC 3	0.055 (0.168)
FAC 5	0.536 (0.174)***
Constant	2.310 (0.182)***

Standard errors are in parentheses.

Dependent variable is Overall Customer Loyalty.

Number of observations: 428.

***, ** and * indicate significance at 1%, 5%, and 10% level respectively.

Note: This table shows the estimates of independent variables in the model.

This finding of the correlation analysis shows positive and significant relationships between two factor groups (FAC 2 and FAC 5) and the Overall Customer Loyalty. This implies that customers who regard the Service Features and Price as the important matters are more likely to repeat patronage in the case of holding debit card. This outcome is in line with the fact in Vietnam. Cardholders in Vietnam expect

debit cards to have many of similar features to cash such as the convenience in making payments for goods and services (representing the availability of cash in ATM, the spreading of payment points and the easiness in payment processing). Also, customers reveal their expectation of using debit card make them avoid many limitations of holding cash (such as easily acquiring counterfeit money, being lost or stolen, inconvenience and lack of security as holding a large amount of money, etc.). Besides, card holders desire to earn interest rate on account balance greater than transaction fees paid to banks. Because customers pay attention to service features and price as deciding whether they should continue to use debit cards or not, it is necessary for Vietnamese banks to improve their service features and price policies in order to meet customer needs as well bank's profitability expectation.

4.2. Findings in stage 2

In this stage, we examine the impact of demographic variables on factor groups having significant correlation with the Overall customer Loyalty (named FAC 2 and FAC 5 found in stage 1). Running the linear regression to check the relationship between Independent variables in Table 1 and FAC 2, the results are expressed in Table 6. The adjusted R –Squared is 31.9% showing that independent variables explain 32.9% the variation of the dependent variable. The Durbin Watson test statistic value is 1.706 (lies between 1 and 3). Thus, there is no autocorrelation in the model (see Appendix No. 3).

Table 6

The impact of demographic variable on FAC 2

Independent variables	Estimates
Male	-0.073* (0.085)
Being student	-0.211*** (0.161)
Doing the housework	-0.086** (0.333)
Being a public servant	-0.192*** (0.091)
Under the age of 30	0.140*** (0.89)
Bachelor	-0.093** (0.084)
Pay for goods and services at stores	0.137*** (0.101)
Online shopping	0.114*** (0.090)
Check real time balance	0.200*** (0.098)
The total payment value with card more than in cash	-0.157*** (0.101)
Spreading point of sale network	0.128*** (0.097)
Efficient customer service	0.203*** (0.094)
Modern mass media such as social network, e-media…	-0.327*** (0.096)
Advertisement/leaflets	-0.104** (0.123)
Being bank's existing customer	-0.101** (0.093)
Safe place for money	0.085** (0.088)
Style of person having high technology preference	-0.087** (0.104)
Personality	0.074* (0.115)
Constant	-0.198 (0.153)

Note: This table indicates the correlation between demographic variables and FAC2. Standard errors are in parentheses. The number of observations is 428. ***, **, and * indicate significance at 1%, 5% and 10% levels respectively.

Results in Table 6 show that there are 18 out of 44 demographic variables being correlated with FAC 2. For eight variables that are positively correlated with FAC 2, we note that a certain portion of customers have a higher demand for Service Features than others. They are under the age of 30, using debit cards to pay for goods and services in stores or online shopping, using debit card to check real time balance. For them, debit cards are considered to be safe to store money and express their personality. This cardholder group selects debit card providers because of the spreading point of sale network and efficient customer service. Thus, if a bank targets the customer segment with above characteristics, the bank should improve all items in FAC 2 in order to retain customer loyalty. For 10 variables having a negative correlation with FAC 2, we find that a specific portion of customers requires less than others about Service Features. They are men, being students or doing housework or being public servants. Importantly, this group includes customers who graduated universities or colleges and having been paying for goods and services with debit cards greater than in cash. This consumer group gets to know about debit cards via e-media, social networks, advertisements or leaflets or through using other banking services. For them, bank card in general and debit cards in particular express the style of high-tech preference. Thus, if a bank targets the customer segment with these features, it should remain all items in FAC 2 as the present level and give priority to other sides of debit card services. To explain

the relationship between Independent variables in Table 2 and FAC 5, we continued to run the linear regression, acquired results expressed in Table 7. The adjusted R –squared is 16.7% indicating that independent variables explain 16.7% the variation in the dependent variable. The Durbin Watson test statistic value is 2.101 (lies between 1 and 3). Thus, there is no autocorrelation in the model (see Appendix No. 4).

Table 7

The impact of demographic variables on FAC 5

Independent variables	Estimates
Running business	-0.206*** (0.117)
Being a public servant	-0.146*** (0.110)
Technology preference	0.102** (0.135)
Vietinbank	-0.077* (0.112)
Pay for goods and services at stores	0.167*** (0.106)
Online shopping	0.114** (0.101)
Pay for goods and services with card more than that in cash	0.137** (0.145)
The total payment value with card more than in cash	-0.167*** (0.145)
Readily change provider aiming at paying with card instead of paying in cash	-0.152*** (0.099)
Good reputation	-0.133*** (0.108)
Efficient customer service	0.206*** (0.101)
Modern mass media such as social network, e-media…	0.100** (0.095)
Safe place for money	-0.120** (0.095)
Personality	-0.095** (0.127)
Constant	-0.071 (0.167)

Note: This table indicates the correlation between demographic variables and FAC 5. Standard error is written in parentheses. Number of observations is 428. ***, **, and * indicate significance at 1%, 5% and 10% level respectively.

The outcome, shown in Table 7, indicates the relationship between demographic variables and FAC 5. There are 14 out of 44 demographic variables having a correlation with FAC 5, including six positively correlated variables and eight negatively correlated variables. For six variables having positive correlation, we highlight that a specific portion of cardholders highly demand for Price more than others. This customer group consists of consumers who prefer high technology, get to know bank card through e-media, social networks. They use debit card for making payments at stores or e-shopping and also pay for goods and services with debit cards more than in cash. The reason for them to select card provider is good customer service. Thus, price policy is what banks need to concern about if they target to these consumer segments. For 8 variables having a negative correlation, these results indicate that a certain portion of customers pays less attention to Price than others. The common feature of this group is cardholders who are running businesses or public servants. They are Vietinbank's customers. They use debit cards for making payments with larger amount than paying in cash and thus they are willing to change card provider for paying with debit card if the current provider cannot meet their expectations. Due to their preference for payments in cards, they choose card providers with high reputation in the hope of acquiring a safe place for their money. This consumer group also desires bank card to show their personality. This outcome suggests that banks should keep their current price policy and give priority to other matters involved in debit card services if they are willing to offer debit card services to above customer group.

Moreover, we add two important findings as below:

Customers who are more interested in both Service Features and Price determinants than others (expressed by positively correlated with both FAC 2 and FAC 5) are cardholders using debit cards for making payments in stores or online shopping. This group also chooses debit card providers with good customer services. His customer segment would prefer and have a habit of making payments for goods and services by debit card through POS or carrying electronic transfers. In other words, they often use debit card for the purpose of payments rather than cash withdrawals. For countries like Vietnam that cardholders mainly have used their card for cash withdrawals (accounts for 86.6% of total cardholders according to report of Vietnam bank card Association in 2016), banks should explore and target this segment of customers in order to widen their customer base in line with increasing their revenues from debit card services. This segment of customer has high expectation on account security and privacy, payment process, advantages and POS networks involved in debit cards. Furthermore, this customer

group also concerns about banks' price policy including interest rates on deposit accounts and fees paid for payment services more than others. They rarely or sometimes take money out of their demand account for using cash, so that they ask for earning proper interest rate on the account balance and being charged reasonable fees. The more customers make payments with debit cards, the better customer services they desire in the hope of being rapidly and efficiently solved all problems involved in debit cards transactions. To improve the convenience and security for all debit card services, it is inevitable for banks to customize services to meet the need of different customer groups with above characteristics. For price policy, it is difficult for banks to increase interest rates on demand deposit accounts for many reasons such as the right of depositors to withdraw cash or make payments as needed, the large amount of investment on maintaining and upgrading payment systems, etc. Thus, to attract the above customer segment, banks should strengthen their relationship with other goods and service providers in order to increase benefits for customers instead of the decline in fees and rise in interest rates.

On the other hand, there is a certain portion of customers who are less interested in Service Features and Price determinants than others (represents a negative correlation with both FAC 2 and FAC 5). They are public servants or consumers whose value paid by card is greater than paid in cash. According to the Directive No. 20/2007/CT-TTg on the increase in noncash payment signed by the Vietnam's Prime Minister in 2007, staffs who work in state agencies have to register to receive salaries and wages via their bank accounts from the date 1/1/2008. Thus, up to the beginning of 2017, this customer group has experienced long time for finding and using bank cards. The rapid development in payment services especially in paying for utilities in combination with their lack of time spending for daily purchases make them get used to making payments by many of bank cards and easily compare services offered by different banks. Up to now, services involved in debit card provided by most of Vietnamese banks have been relatively even. Customers have already chosen suitable banks they expect to be served long-lasting. Due to above explanation, the customer group has less concern about FAC 2 and FAC 5 because they deeply understand about services involved in debit cards issued by Vietnamese banks. Thus, if banks target this segment, they should keep their recent service features and price policy plus providing related or complementary products with debit card services (also called cross-selling) to existing cardholders.

In short, through applying EFA, Logistic regression and Linear regression techniques to a dataset of 428 cardholders in Hanoi, we found out that Service Features and Price affect the loyalty of customers holding debit cards offered by Vietnamese banks. Moreover, customers in different groups of demographic characteristics express different concerns about these two determinants. Clearly, cardholders who usually pay for goods and services at stores or online shopping, choose banks with good customer care reveal higher demand for these two determinants than others. Conversely, cardholders who are public servants or make payments with card greater than in cash in value reveal their less concern about these two determinants. These findings suggest banks should conduct different policies in line with each of customer group and based on their strategies.

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Appendix No. 1: Validity and reliability tests of scales in stage 1

KMO and Bartlett's test in stage 1

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.838
Bartlett's Test of Sphericity	Approx. Chi-Square	5614.542
	Df	253
	Sig.	0.000

TOTAL VARIANCE EXPLAINED IN STAGE 1

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.892	29.966	29.966	5.124	22.277	22.277
2	4.022	17.485	47.451	3.857	16.768	39.045
3	1.566	6.809	54.261	2.094	9.104	48.149
4	1.430	6.217	60.478	2.056	8.938	57.087
5	1.235	5.368	65.845	2.014	8.759	65.845
6	0.889	3.866	69.711			
7	0.855	3.719	73.430			
8	0.706	3.070	76.499			
9	0.672	2.923	79.423			
10	0.606	2.637	82.060			
11	0.560	2.435	84.494			
12	0.507	2.206	86.700			
13	0.462	2.008	88.708			
14	0.418	1.818	90.526			
15	0.378	1.642	92.168			
16	0.334	1.451	93.619			
17	0.324	1.411	95.030			
18	0.274	1.191	96.221			
19	0.235	1.020	97.240			
20	0.198	0.860	98.101			
21	0.176	0.764	98.865			
22	0.151	0.657	99.521			
23	0.110	0.479	100.000			

Extraction Method: Principal Component Analysis.

ROTATED COMPONENT MATRIX IN STAGE 1

	Component				
	1	2	3	4	5
Opening card advice	0.870				
Attitude	0.861				
Care	0.810				
Product advice	0.806				
Problem solving time	0.801				
ATM	0.677				
Branches	0.650				
Money safety		0.852			
Privacy security		0.849			
Account security		0.822			
Money availability		0.693			
Process		0.610			
Network		0.598			
Conveniences		0.592			
Fame			0.824		
Reputation			0.800		
Transaction fees				0.784	
Interest rate				0.746	
Opening fees				0.511	
Promotion					
Balance					0.767
Procedures					0.698
Products					0.685

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

RELIABILITY STATISTICS FOR FAC 1 IN STAGE 1

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.875	0.875	7

RELIABILITY STATISTICS FOR FAC 2 IN STAGE 1

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.866	0.868	7

RELIABILITY STATISTICS FOR FAC 3 IN STAGE 1

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.732	0.733	2

RELIABILITY STATISTICS FOR FAC 4 IN STAGE 1

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.645	0.644	3

RELIABILITY STATISTICS FOR FAC 5 IN STAGE 1

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.823	0.825	3

Appendix No. 2

Validity and reliability tests of logistic model in stage 1

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	270.200[a]	0.049	0.100

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than 0.001

HOSMER AND LEMESHOW TEST

Step	Chi-square	df	Sig.
1	21.093	8	0.007

Appendix No. 3

Validity and reliability tests of linear regression

Model examined the impact of demographic variables on FAC 2

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	0.612	0.375	0.292	0.84061009	0.375	4.517	50	377	0.000	
2	0.612	0.375	0.294	0.83949774	0.000	0.000	1	377	0.987	
3	0.612	0.375	0.295	0.83839003	0.000	0.000	1	378	0.983	
4	0.612	0.375	0.297	0.83728715	0.000	0.001	1	379	0.976	
5	0.612	0.375	0.299	0.83618860	0.000	0.001	1	380	0.976	
6	0.612	0.375	0.301	0.83510001	0.000	0.006	1	381	0.938	
7	0.612	0.375	0.303	0.83402208	0.000	0.012	1	382	0.913	
8	0.612	0.375	0.305	0.83295293	0.000	0.016	1	383	0.899	
9	0.612	0.375	0.306	0.83190217	0.000	0.029	1	384	0.864	
10	0.612	0.374	0.308	0.83086946	0.000	0.042	1	385	0.837	
11	0.612	0.374	0.310	0.82996259	0.000	0.156	1	386	0.693	
12	0.611	0.374	0.311	0.82909808	0.000	0.192	1	387	0.661	
13	0.611	0.374	0.312	0.82821594	0.000	0.173	1	388	0.678	
14	0.611	0.373	0.314	0.82745627	0.000	0.285	1	389	0.594	
15	0.611	0.373	0.315	0.82666135	0.000	0.249	1	390	0.618	
16	0.610	0.372	0.316	0.82589834	0.000	0.277	1	391	0.599	
17	0.610	0.372	0.318	0.82510766	0.000	0.248	1	392	0.619	
18	0.609	0.371	0.319	0.82436345	0.000	0.290	1	393	0.591	
19	0.609	0.371	0.320	0.82379009	-0.001	0.451	1	394	0.502	
20	0.608	0.370	0.321	0.82328499	-0.001	0.515	1	395	0.474	
21	0.607	0.369	0.321	0.82284153	-0.001	0.572	1	396	0.450	
22	0.607	0.368	0.322	0.82242110	-0.001	0.593	1	397	0.442	
23	0.606	0.367	0.323	0.82202507	-0.001	0.616	1	398	0.433	
24	0.605	0.366	0.324	0.82153037	-0.001	0.519	1	399	0.472	
25	0.604	0.365	0.324	0.82143639	-0.001	0.908	1	400	0.341	
26	0.603	0.363	0.323	0.82156820	-0.002	1.129	1	401	0.289	
27	0.601	0.361	0.323	0.82178734	-0.002	1.215	1	402	0.271	
28	0.599	0.359	0.323	0.82192816	-0.002	1.138	1	403	0.287	
29	0.598	0.357	0.322	0.82227915	-0.002	1.346	1	404	0.247	
30	0.595	0.354	0.321	0.82314359	-0.003	1.854	1	405	0.174	
31	0.592	0.351	0.319	0.82423675	-0.003	2.082	1	406	0.150	1.706

Appendix No. 4: Validity and reliability tests of linear regression

Model examined the impact of demographic variables on FAC 5

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	0.501	0.251	0.152	.92003466	0.251	2.525	50	377	0.000	
2	0.501	0.251	0.154	.91881849	0.000	.001	1	377	0.971	
3	0.501	0.251	0.156	.91763156	0.000	.021	1	378	0.884	
4	0.501	0.251	0.158	.91645690	0.000	.028	1	379	0.868	
5	0.501	0.251	0.160	.91529909	0.000	.038	1	380	0.846	
6	0.501	0.251	0.162	.91413916	0.000	.032	1	381	0.857	
7	0.501	0.251	0.164	.91300166	0.000	.047	1	382	0.828	
8	0.500	0.250	0.167	.91187557	0.000	.053	1	383	0.817	
9	0.500	0.250	0.169	.91078379	0.000	.079	1	384	0.779	
10	0.500	0.250	0.170	.90975459	0.000	.128	1	385	0.721	
11	0.500	0.250	0.172	.90874875	0.000	.145	1	386	0.704	
12	0.499	0.249	0.174	.90788040	-0.001	.259	1	387	0.611	
13	0.499	0.249	0.175	.90707743	-0.001	.312	1	388	0.577	
14	0.498	0.248	0.177	.90624867	-0.001	.288	1	389	0.592	
15	0.497	0.247	0.178	.90552530	-0.001	.376	1	390	0.540	
16	0.497	0.247	0.179	.90479237	-0.001	.366	1	391	0.546	
17	0.496	0.246	0.181	.90403473	-0.001	.342	1	392	0.559	
18	0.495	0.245	0.182	.90331321	-0.001	.371	1	393	0.543	
19	0.494	0.244	0.183	.90288275	-0.001	.624	1	394	0.430	
20	0.493	0.243	0.184	.90247591	-0.001	.643	1	395	0.423	
21	0.492	0.242	0.184	.90200815	-0.001	.589	1	396	0.443	
22	0.490	0.240	0.185	.90177236	-0.002	.792	1	397	0.374	
23	0.488	0.239	0.185	.90166672	-0.002	.907	1	398	0.342	
24	0.486	0.236	0.185	.90185708	-0.002	1.169	1	399	0.280	
25	0.484	0.234	0.185	.90196593	-0.002	1.097	1	400	0.296	
26	0.482	0.232	0.184	.90214296	-0.002	1.158	1	401	0.283	
27	0.479	0.229	0.183	.90266320	-0.003	1.465	1	402	0.227	
28	0.476	0.227	0.183	.90302404	-0.003	1.323	1	403	0.251	
29	0.473	0.224	0.182	.90335173	-0.002	1.294	1	404	0.256	
30	0.469	0.220	0.180	.90449832	-0.004	2.031	1	405	0.155	
31	0.465	0.216	0.178	.90559381	-0.004	1.986	1	406	0.159	
32	0.462	0.213	0.177	.90627099	-0.003	1.610	1	407	0.205	
33	0.457	0.209	0.174	.90763923	-0.004	2.236	1	408	0.136	
34	0.452	0.205	0.172	.90907750	-0.004	2.300	1	409	0.130	
35	0.448	0.201	0.170	.91024846	-0.004	2.059	1	410	0.152	
36	0.443	0.197	0.167	.91143537	-0.004	2.075	1	411	0.150	2.101