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Abstract

Plastic money is a new trend in the economy which is a suitable alternative for cash payment. Credit card is one of them. It is a plastic card issued by a Bank and a Non-Banking Financial Company ready to lend money to its customers. It encourages the customers to spend on goods & services, based on the credit sanctioned to them. This limit relies on the earning capability of the individual. The repayment is done along with interest either after a period of 45 days or on monthly billing basis. There are pros and cons of using the credit card. Increasing fraud amongst its users is the main drawback. The problem of fraud is a serious issue in e-banking services that threaten the credit card transactions. Fraud is a public law violation in which the fraudster gains an unlawful advantage or causes unlawful damage. The survey enlightens upon the awareness of the credit card frauds among its users.

Keywords: Awareness, Credit Card, Fraud, Repayment, Unlawful

Introduction

E-payments and the online banking system are commonly recognized throughout the globe in today's age as they make the payment system and the banking transaction simpler and quicker. Credit card is one of the payment method which enables the customers to make payments at their convenience without carrying hard cash. Credit card originated in the 1920s in the United States. Diners club was the first to introduce the credit card followed by American Express in the year 1958. As and when the market developed the existence of credit card came into effect. People in the western region started accepting it on a large scale and promoted use of plastic money. In the eastern region this concept came a bit later. Central Bank of India came up as the first credit card issuer in the country. Earlier people didn't accept this concept as most of them were unaware of the advantages of using plastic money. Master and Visa card in 1990 became popular. Nearly every bank has today embraced the notion of credit cards. It is widely accepted by individuals today. It is been issued by the banks and the non-banking financial company to its customers the limit of which depends on the income of the individual. The issuer will then enter into an agreement with various shopping institutions throughout the nation covering almost every aspect of human necessity, from restaurants to the departmental stores, shops in the mall, travel agencies, jewellery shops and many more to sell credit card based products. The holders can use the cards to receive up to 45 days of credit from the banks. The card relieves customers and guarantees safety without any danger of carrying money. It is convenience without formality of prolonged credit. Thus, credit card is a "security, comfort, prestige and credit" passport. If the customer defaults to repay the credit sanctioned within the stipulated time period, then he/she has to bear the interest charges added upon the amount spent through the credit card. Since there are disadvantages for every pro, fraud is the primary disadvantage of using credit card. Many customers possess one but are afraid of using the same only because of the increasing number of frauds in the banking system.

Fraud is carried out by multiple means, such as unlawful or unauthorized use of private gain account, misrepresentation of account data in order to acquire products or services, and criminal deception by using unauthorized account. There are various kinds of credit card frauds which are as follows:

Stolen/lost card

The card will be taken out of your ownership, either by theft or because you lost it. It will then be used by the criminals who get their hands on it to make payments. It is hard to do so through computers because they will need the PIN. Using a found or stolen card to create online purchases, however, is simple enough. That's why it is essential to cancel the card as soon as you find out that the card is missing.

Counterfeit card

Counterfeit card fraud generally occurs by skimming. This means that all your card details are held by a fake magnetic swipe card. The fake card is exactly the copy of the original one. During transactions, fraudsters can readily use the fake card. It can also be achieved if the fraudster knows the information of your card.

Application fraud

Application fraud in combination with identity theft usually occurs. It is when the applicant fraudulently attempts to apply with your papers for a fresh credit card. Banks are now trying to control this fraud by demanding only original documents and also by verifying the details with the owner of the documents.

Card holder not present

If the card details are known by someone, they can use the card for transacting without being in the physical possession of it. It occurs primarily when your information is stolen by different means. It can either be through phone, e-mail or internet.

Need of the Study

Aim of the study

The aim of the research is to determine the awareness of credit card frauds among the users in the Mumbai region.

Objective of the study

- 1. To study about the awareness of credit card frauds.
- 2. To study about the types of credit card frauds.

Literature Review

N Sivakumar, Dr.R.Balasubramaniam (2015) principally focuses on classification, numerous forms of fraud in the credit card by fraudsters and therefore the direction used to find fraud in economic manner. The excellent news is that in latest times, technology to prevent credit card fraud is also rising and lowering computing costs helps to introduce the complex systems that can analyse fraudulent activity in a manner of a fraction of a second.Suman, Mitali Bansal (March 2014) they both have explained the technologies that can be rebounding to detect the frauds in the paper.

These technologies helped to diagnose the credit card fraud and gave acquiescent result. It also helped to distinguish the credit card transactions generally into legitimate and fraudulent transactions. Delamaire, HAH and Pointon (2009) Different types of credit card frauds were identified and alternative techniques used in fraud detection were reviewed. There was also comparison and analysis of recently published findings in credit card fraud detection. The significance of application of the techniques reviewed here is in the minimization of credit card fraud. Mr. K. Kathirvel (March 2013) this study focused on the credit card frauds and the measures to prevent and detect them. The mechanism of operation of credit card had been illustrated. In India the numbers of frauds are low as compared to other countries as its industry is in its nascent stage and the credit limit offered is low. Banks are been advised to strengthen their internal control system to detect the credit card frauds. Karthik G Menon, Mahima Balan, M.Soumya Krishnan (July 2017) in this paper, a survey was been conducted among the digital bank users, based on various banking transactions to find the most appropriate one having least fraudulent dealings. Various tips were given to create awareness among the users to avoid the frauds by choosing the best banking transaction.Dr. S.Sudhagar (2012) this study focused on the perception and awareness on credit cards among the customers in the Krishnagiri District. According to the author many people have the knowledge about the credit cards but do not possess it as they have the fear of falling into the debt trap. The usage of the same is comparatively low among the users because of the higher interest rates charged by the Banks. This has led to surrender of the credit cards and instead use the debit cards. Anju Rohilla, Ipshita Bansal (2015) study is conducted to examine trends in Indian Banking industry regarding the credit card frauds. The results show in recent years there has been a declining trend in online fraud, which shows banks concern about safety measures & detecting new fraud methods & creating the measure to fight against them. The number of credit card frauds had increased in the past which has led to huge losses for the banks. Due to the safety measures taken by banks the same has now been decreasing in the recent trend. Linda Mary Simon, Dr. S.Saravanan (2012) a careful analysis of the credit card users had been done in this paper by the authors. People in India did not accept the concept of credit cards in the early stage because of the cons such as the card fees, interest charges and the fear of frauds. So few measures need to be taken to increase the number of users by making it more convenient and attractive .Suman, Nutan (July 2013) this paper provides a study of present methods used in detection of credit card frauds and fraud in telecommunication. The purpose of this paper is to provide an extensive overview of various fraud detection methods. One of the mixture of the algorithms is applied to the fraud detection scheme of the bank credit cards, the likelihood of fraud operations can be anticipated shortly after the transaction is been carried out. And it is possible to adopt a series of anti-fraud policies to avoid large losses before banks and decrease hazards.

Literature Gap

As per the existing study on fraud detection and measures to avoid/control them, the proposed study focuses mainly on the awareness of the frauds and what measures the users took when encountered with the same.

Hypotheses

H0: The number of credit card users not aware about credit card frauds are significantly low.

H1: The number of credit card users aware about the credit card frauds are significantly high.

Research Methodology and Design

The research has been undertaken to study the level of awareness of credit card users between users in Mumbai region. The research based on the exploratory study.

Sample Design

The sample designed for advance planning to use the appropriate methods to adopt for collecting the relevant data and the techniques. The study incorporated both the kind of data primary as well as secondary.

Sample design is based on convenience sampling Method. The sample of proposed study is type of non-probability sampling in which respondents are sampled simply because they are "convenient" source of data for the research study.

Data Collection

Primary Data: Primary data is collected from credit card users (the respondents) with the help of a well-structured questionnaire. Around 234 questionnaires distributed among respondent and out of 195 responses filled altogether. The balance responses are not considered as they were not completely filled by the individuals.

Secondary Data: The study extracted secondary data from the various sources which includes research journals, books, thesis reports, the internet for online journals and certain published sources by RBI.

Questionnaire Design

The questionnaire has been incorporated 13 questions in all, which has been divided into two sections.

- 1. Personal information
- 2. Multiple choice Questions

Table 1: Questionnaire Design

Section	Variable has been considered	Questions included in each section	Measurement
Personal information	Demographic factors 1. Gender 2. Age 3. Occupation 4. Education 5. Annual Income	Q. 1 to Q. 5	Nominal
Multiple Choice Questions	Awareness 1.No of credit card 2. Which bank's 3. Frequency of usage 4. Cashless payments leads to fraud 5. Trust that card details are secure 6. Awareness of frauds 7. Have you encountered with fraud 8. What actions have taken	Q. 6 to Q.13	Nominal

Source- Primary Data

Data analysis

Descriptive Analysis

As per the survey, the male respondents were higher than female respondents by 29. This indicates that males are the dominant users. More than 50% of the credit card users are millennials while majority of them are salaried. 90.2% of the customers are graduates and post graduates. Only 17.4% of the respondents earn above Rs.10 lakhs whereas rest of them earn below than that. (Refer appendix 1)

Factor Analysis Results

The Factor Analysis was applied for the identification of the core factors affecting the investor's decisions of gold investment in Mumbai region. This technique was considered appropriate as it requires no preexisting of functional relationships and is a well-known for data reduction. It is used to reduce large number of variables into a few numbers of core factors.

Reliability: The reliability test has been taken into consideration to prove the authentication of research data. Reliability test has been extracted with help of Cronbach alpha. SPSS output given below

 Valid
 195
 100.0

 Excludeda
 0
 .0

 Total
 195
 100.0

Table 2: Case Processing Summary

Source-Primary Data

a.Listwise deletion based on all variables in the procedure.

Table 3: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.741	.237	8

Source-Primary Data

Cronbach alpha is 0.741 so it shows that the reliability of this data is 100% as standard value of Cronbach alpha should be 0.6, however, if any researcher willing to do any project in future he/she can relies on this data if they want to conduct research based on Awareness of Credit Card Fraud in Mumbai Region.

Adequacy Test: The Kaiser-Meyer-Olkin is the measure of sampling adequacy, which varies between 0 and 1. The values closer to 1 are better and the value of 0.7 is the suggested minimum. The Bartlett's Test of Sphericity is the test for null hypothesis that the correlation matrix has an identity matrix. Taking this into consideration, these tests provide the minimum standard to proceed for Factor Analysis.

Table 4:KMO and Bartlett's Test

Kaiser-Meyer-Olkin Adequacy	Measure of Sampling	.768
	Approx. Chi-Square	421.609
Bartlett's Test of Sphericity	Df	66
	Sig.	.000

Source-Primary Data

Normally, 0 < KMO < 1

If KMO > 0.5, the sample is adequate.

Here, KMO = 0.768 which indicates that the sample is adequate and we may proceed with the Factor Analysis.

Bartlett's Test of Sphericity: Taking a 95% level of Significance = 0.05

The p-value (Sig.) of .000 < 0.05, therefore the Factor Analysis is valid.

As $p < _$, we therefore reject the null hypothesis H0 and accept the alternate hypothesis (H1) that there may be statistically significant interrelationship between variable.

The Kaiser-Meyer-Olkin (KMO) and Bartlett's Test measure of sampling adequacy was used to examine the appropriateness of Factor Analysis. The approximate of Chi-square is 421.609 with 66 degrees of freedom, which is significant at 0.05 Level of significance. The KMO statistic of 0.768 is also large (greater than 0.50). Hence Factor Analysis is considered as an appropriate technique for further analysis of the data.

Eigen values (Select those components with Eigen Values >= 1): The initial components are the numbers of the variables used in the Factor Analysis. However, not all the 12 variables will be retained. In the present research only the 5 factors will be extracted by combining the relevant variables. The Eigen values are the

variances of the factors. The total column contains the Eigenvalue. The first factor will always account for the most variance and hence have the highest Eigen values. The next factor will account for as much of the left over variance as it can and the same will continue till the last factor. The percentage of variance represents the percent of total variance accounted by each factor and the cumulative percentage gives the cumulative percentage of variance account by the present and the preceding factors. In the present research the first 5 factors explain 65.25 % of variance.

The rotation sums of the squared loading represent the distribution of the variance after the varimax rotation with Kaiser Normalisation. The varimax rotation tries to maximize the variance of each of the factor.

Eigen Values – Total Variance Explained:

Table 5: Total Variance Explained

nt	Iı	nitial Eigen	values	Extrac	Extraction Sums of Squared			Rotation Sums of Squared		
ne				Loadings			Loadings			
l od	Total	% of	Cumulative	Total	% of	Cumula	Total	% of	Cumulati	
Component		Variance	%		Variance	tive %		Varianc	ve %	
								e		
1	2.595	21.621	21.621	2.595	21.621	21.621	2.024	16.867	16.867	
2	1.712	14.266	35.887	1.712	14.266	35.887	1.847	15.393	32.260	
3	1.255	10.459	46.346	1.255	10.459	46.346	1.511	12.591	44.851	
4	1.170	9.747	56.093	1.170	9.747	56.093	1.278	10.650	55.500	
5	1.099	9.161	65.254	1.099	9.161	65.254	1.170	9.754	66.254	
6	.942	7.847	73.101							
7	.756	6.302	79.403							
8	.685	5.705	85.109							
9	.618	5.153	90.262							
10	.542	4.516	94.778							
11	.392	3.269	98.047							
12	.234	1.953	100.000							

Source-Primary Data

Extraction Method: Principal Component Analysis.

On the basis of Varimax Rotation with Kaiser Normalisation, 5 factors have been extracted. Each factor is constituted of all those variables that have factor loadings greater than 1. 12 variables were clubbed into 5 factors. 5 factors were extracted from the 12 variables used in the study. These 5 extracted factors explained 65.25% of the variability the performance of factors which influence credit card frauds. This explains almost two-third of the variability.

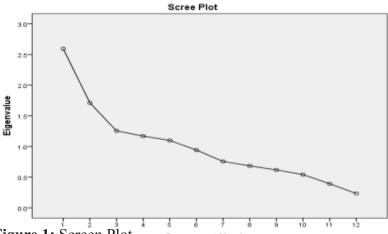


Figure 1: Screen Plot Component Numb

Scree Plot:

The scree plot graphs the Eigenvalue against the each factor. We can see from the graph that after factor 3 there is a sharp change in the curvature of the scree plot. This shows that after factor 3 the total variance accounts for smaller and smaller amounts.

Name of the five core factors

Table 6: The variables that have been included in each core factor

Factor	Variables Included	Name of
		the factor
1	• Age	Earning
	• Annual Income	factor
2	How many credit cards do you have?	Utility
	Which Bank's credit card do you have?	Factor
3	How often do you use credit card?	Safety
	• Do you trust that your card details are secure with the online entities?	Factor
4	Do you think using various medium of cashless payment leads to	Familiar
	fraud/theft?	Factor
	• Which of the following credit card frauds are you aware of?	
	• Have you or person known to you encountered any of the above	
	frauds?	
5	• What course of action have you taken in the case of credit card	Non Inert
	fraud?	Factor
	• Gender	
	• Occupation	

Source-Primary Data

Table 7: Rotated Component Matrix^a

Component				
1	2	3	4	5
.285	.770	218	088	029
105	.646	.354	.238	.125
113	716	.293	.169	.083
113	.010	780	.082	.029
035	185	.742	100	.042
133	.052	.018	.778	132
.048	125	266	.669	.224
.028	.134	.025	.134	.836
209	405	006	236	.608
.670	.157	.140	202	.016
791	.082	.021	030	.092
.875	.243	040	.030	010
	.285105113113035133 .048 .028209 .670791	1 2 .285 .770105 .646113716 113 .010 035185 133 .052 .048125 .028 .134209405 .670 .157791 .082	1 2 3 .285 .770 218 105 .646 .354 113 716 .293 113 .010 780 035 185 .742 133 .052 .018 .048 125 266 .028 .134 .025 209 405 006 .670 .157 .140 791 .082 .021	1 2 3 4 .285 .770 218 088 105 .646 .354 .238 113 716 .293 .169 113 .010 780 .082 035 185 .742 100 133 .052 .018 .778 .048 125 266 .669 .028 .134 .025 .134 209 405 006 236 .670 .157 .140 202 791 .082 .021 030

Source-Primary Data

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 6 iterations

The above matrix gives the correlation of the variables with each of the extracted factors. Usually, each of the variables is highly loaded in one factor and less loaded towards the other factors. To identify the variables, included in each factor, the variable with the value maximum in each row is selected to be part of the respective factor. The values have been highlightened in each of the rows to group the 12 variables into 5 core factors.

Thus, after rotation, Factor 1 accounts for 16.867% of the variance; Factor 2 accounts for 15.393% of the variance; Factor 3 accounts for 12.591% of the variance; Factor 4 accounts for 10.649% of the variance; Factor 5 accounts for 9.754% of the variance. All the 5 factors together explain for 65.254% of the variance in performance of Open Ended Equity Scheme.

Table 8: Identification of Variables related factors in Variables Selection

Factor Name	Variables Included	Factor
		Loading
Earning factor	• Age	.670
	Annual Income	.875
Utility Factor	How many credit cards do you have?	.770
	Which Bank's credit card do you have?	.646
Safety Factor	How often do you use credit card?	.293
	• Do you trust that your card details are secure with the online entities?	.742
Familiar Factor	 Do you think using various medium of cashless payment leads to fraud/theft? Which of the following credit card frauds are you 	.082
	aware of?	.778
	• Have you or person known to you encountered any of the above frauds?	.669
Non Inert Factor	What course of action have you taken in the case of credit card fraud?	.836
	Gender	.608
	Occupation	.092

Source-Primary Data

Findings

The Factor Analysis has identified 5 core factors that show the awareness of credit card frauds between people of Mumbai region.

Factor 1 – Earning factor

This factor suggests the approach towards using and handling fraud like situation. The first factor suggests 16.86% of variability towards awareness of fraud.

Factor 2 – Utility factor

The second factor relates to which bank's credit card they use and number of credit cards. This factor explains 15.39% of variability towards awareness of fraud.

Factor 3 – Safety factor

This factor relates to frequency of using the credit cards as well as trust they have on online platforms whether there card details are secure. This factor explains 12.59% of variability towards awareness of fraud.

Factor 4 – Familiar factor

This factor suggests how familiar they are while using credit cards or plastic money for that matter as well as which kind of frauds they are aware of. This factor explains 10.65% of variability towards awareness of fraud.

Factor 5 – Non Inert factor

This factor suggests what actions they have taken in case of fraud and is it sufficient. This factor explains 09.75% of variability towards awareness of fraud.

Conclusion

All the above mentioned factors on credit card fraud awareness were considered valid in the context of the present research. In the case of credit card fraud in the Mumbai region, people were mostly aware of the different types of frauds and what separate course of action they should take in case of the event.

According to the recent data, the number of frauds has decreased as customers become more aware of it. Banks take steps to detect fraud with the assistance of detection method as quickly as the transaction is completed. Many banks are using detection methods at the moment, but not all banks have embraced this technology. This technology will quickly be available to all the banks.

Managerial Implication

By identifying the role of unfamiliar people, the legislative body can organize awareness campaigns and try to increase the awareness of credit card frauds and the steps it can take in the event of fraud.

Limitation

The suggested study is restricted to the region of Mumbai, whose demographic variables relied only on consumers of credit cards. The research will have scope in the future.

Contribution of Research

The study contributed specific and authentic data analysis on awareness of credit card frauds in Mumbai region. The writers have contributed five key Variables including Earning, utility, Safety, Familiar and Non-inert variables that are reliable to verify users' knowledge of credit card fraud.

References

Anju Rohilla, Ipshita Bansal(2015, April-June)." Credit Card Frauds: An Indian Perspective", *Volume 2, Issue 6, pp.* 591-597

Delamaire, L, Abdou, HAH and Pointon, J(2009). "Credit card fraud and detection techniques: areview", *Volume 4 Issue 2*

K.Kathirvel(2013, March)."Credit card frauds and measures to detect and prevent them", *Volume 2 Issue* 3

Karthik G Menon, Mahima Balan, M. Soumya Krishnan(2017, July)." An Investigative Research on Fraud Analysis in Digital Banking", *11-special issue*.

Linda Mary Simon, S.Saravanan(2012, November). "A Study on Customers Satisfaction TowardsCredit Card Services Provided by State Bank of India, with special reference to Coimbatore City", *Volume* 2, *Issue 2*.

N. Sivakumar, R.Balasubramanian(2015). "Fraud Detection in Credit Card Transactions: Classification, Risks and Prevention Techniques", *Volume 6, Issue 2*.

S.Sudhagar (2012, July-Aug). "A Study on Perception and Awareness on Credit Cards among Bank Customers in Krishnagiri District", *Volume 2, Issue 3, PP 14-23*.

Suman, Mitali Bansal (2014, March). Survey Paper on Credit Card Fraud Detection, *Volume 3 Issue 3*. Suman, Nutan(2013, July). "Review Paper on Credit Card Fraud Detection", *Volume 4, Issue7*

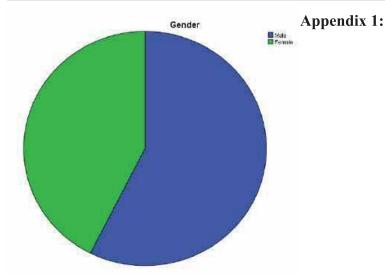


Figure 1: Gender

Table 1: Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male Valid Female Total	112 83 195	57.4 42.6 100.0	57.4 42.6 100.0	57.4 100.0

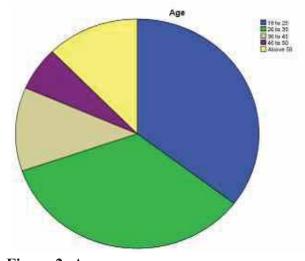


Figure 2: Age

Table 2: Age

		Frequency	Percent	Valid Percent	Cumulative Percent
	18 to 25	69	35.4	35.4	35.4
Valid	26 to 35	67	34.4	34.4	69.7
	36 to 45	23	11.8	11.8	81.5
	46 to 50	12	6.2	6.2	87.7
	Above 50	24	12.3	12.3	100.0
	Total	195	100.0	100.0	

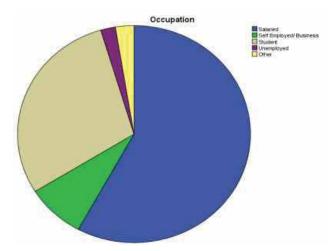


Figure 3: Occupation

 Table 3: Occupation

		Frequency	Percent	Valid	Cumulative
				Percent	Percent
	Salaried	113	57.9	57.9	57.9
Valid	Self Employed/Business	16	8.2	8.2	66.2
	Student	57	29.2	29.2	95.4
	Unemployed	4	2.1	2.1	97.4
	Other	5	2.6	2.6	100.0
	Total	195	100.0	100.0	

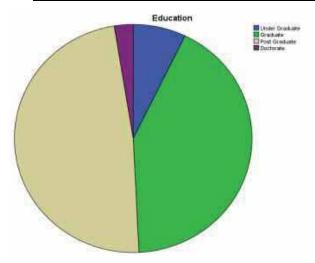


Figure 4: Education

Table 4: Education

		Frequency	Percent	Valid	Cumulative
				Percent	Percent
	Under Graduate	14	7.2	7.2	7.2
Valid	Graduate	82	42.1	42.1	49.2
	Post Graduate	94	48.2	48.2	97.4
	Doctorate	5	2.6	2.6	100.0
	Total	195	100.0	100.0	

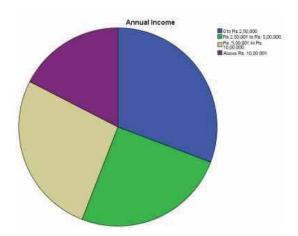


Figure 5: Annual Income

Table 5: Annual Income

		Frequency	Percent	Valid	Cumulative
				Percent	Percent
	0 to Rs. 2,50,000	60	30.8	30.8	30.8
Valid	2,50,001 to Rs. 5,00,000	49	25.1	25.1	55.9
	5,00,001 to Rs. 10,00,000	52	26.5	26.5	82.6
	Above Rs.10,00,001	34	17.4	17.4	100.0
	Total	195	100.0	100.0	

Appendix 2: Pilot Questionnaire							
Personal information							
I. Gender:	a. Male	b. Fen	nale				
II. Age:	a. 18 to 25	b. 26 to 35		c. 36 to 45		d. 46 to 50Above 50	
III. Occupation:Salaried							
	a. Self Employ	ed	b. Student		c. Unemploye	ed	d. Other
IV. Education:	a. Under Gradu	ıate	b. Graduate	•	c. Post Gradu	ıate	d. Doctorate
V. Annual Income: a. 0 to Rs. 2,50,000 b. Rs. 2,50,000 to Rs. 5,00,000							
c. Rs. 5,00,000 to Rs. 10,00,000 d. Above Rs. 10,00,000							
1. How many credit cards do you possess?							
a. One b. Two c. More than 2							
2. Which Bank's credit card do you have?							
a. Citi Bank	b. HDFC Bank	(c. ICICI Ba	nk	d. Axis B	Bank	
3. How often do you use credit card?							
-a. Every day b	. 2-6 times a we	ek c.	Once a wee	k d	l. 2-3 times a m	onth	e. Once a month
4. Do you think various medium of cash less payment leads to fraud/theft?							
a. Yes	b. No						
5. Do you trust that your card details are secure with the online entities?							
a. Yes b. No							
6. Which of the following credit card frauds are you aware of?							

a. Myself

a. Online Application

a. Stolen/ lost card OR Card holder not present

7. Have you or person known to you encountered any of the above frauds?

b. Others

8. What course of action have you taken in the case of credit card fraud?

b. Phone line service

d. None

c. Counterfeit card

b. Mail theft

c. None

c. Bank service