FACTORS AFFECTING ON CREDIT CARD USAGE AMONG UNIVERSITY EMPLOYEES: WITH SPECIAL REFERENCE TO SABARAGAMUWA UNIVERSITY

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ABSTRACT
The role of money as the major medium of exchange has been rapidly changing over time within this knowledge economy, where needs are greatly complicated, and people largely consider security and convenience in fulfilling them. Plastic credit cards have now replaced notes and coins and become a widely used source of convenient credit for restaurants, hotels, on-line shopping, gasoline stations, grocery stores, dental and medical care etc. The five leaders in the credit card industry today, are Visa International, MasterCard, American Express, Discover, and Diner's Club. In this study, credit cards of HSBC, Seylan, Standard Charted, Commercial, Hatten National, Sampath, and Bank of Ceylon were considered. Data have been collected through a questionnaire distributed among academic and non-academic staff in Sabaragamuwa University of Sri Lanka. A sample representing about 50% of staff living in Western, Sabaragamuwa, Central and Southern provinces will minimize the bias due to selecting the sample from one university. A binary logistic regression model was fitted to discover the effect of factors: Gender, Age, Occupation, Race, Education level, Religion, Residency and District on credit card usage. Additionally, the reasons for selecting a bank, most popular credit card, transaction that credit card is highly used and expected advantages were also found through a descriptive statistical analysis. The research has revealed that Occupation has a significant effect on credit card usage while Gender and Age have a combined effect. Findings of the study would be important to bankers, customers and especially to business policy makers or planners in their decision making process mainly on business expansion.

Key Words: Credit Cards, Banking Industry, Customer Expectations, University Employees

1. INTRODUCTION

With so many credit cards on today's market and each one offering different incentives, features and bonuses, it makes it hard to know which one is best for circumstances. A credit card is a system of payment named after the small plastic card issued to users of the system. In the case of credit cards, the issuer lends money to the consumer or the user to be paid later to the merchant. Thus, the plastic credit card is an object which provides a means of identification, a means of transferring value from a seller to a buyer and using credit facility which has already been agreed by either the seller or a third party financial intuitions. Basically, credit card "money" represents a future claim on the money that have later. It is not a store of value.

A credit card allows consumers to purchase products or services without cash and to pay for them at a later date. To qualify for this type of credit, the consumer must open an account with a bank or company, which sponsors a card. Then they receive a line of credit with a specified amount. They can use the card to make purchases from participating merchants until they reach this credit limit. Every month the sponsor provides a bill, which tallies the card activity during the previous 30 days. Depending on the terms of the card, the customer may pay interest charges on the amount that they do not pay for on a monthly basis. Also, credit cards may be sponsored by large retailers (such as major clothing or department stores) or by banks or corporations (like VISA or American Express).

The parties related to credit cards are,

- *Card holder:* The holder of the card used to make a purchase; the consumer.
- *Card-issuing bank:* The financial institution or other organization that issued the credit card to the cardholder. This bank bills the consumer for repayment and bears the risk that the card is used fraudulently.
- *Merchants:* The individual or business accepting credit card payments for products or services sold to the cardholder.
- *Acquiring bank:* The financial institution accepting payment for the products or services on behalf of the merchant.
- *Independent sales organization:* Resellers (to merchants) of the services of the acquiring bank.

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- *Merchant account:* This could refer to the acquiring bank or the independent sales organization, but in general is the organization that the merchant deals with.
- *Credit card association:* An association of card-issuing banks such as Visa, MasterCard, Discover, American express, etc. that set transaction terms for merchants, card-issuing banks, and acquiring banks.
- *Transaction network:* The system that implements the mechanics of the electronic transactions. May be operated by an independent company, and one company may operate multiple networks. Transaction processing networks include: Cardnet, Nabanco, Omaha, Paymentech, NDC Atlanta, Nova, Vital, Concord EFSnet, and VisaNet.
- *Affinity partner:* Some institutions lend their names to an issuer to attract customers that have a strong relationship with that institution, and get paid a fee or a percentage of the balance for each card issued using their name.

There are five leaders in the credit card industry today, such as Visa International, MasterCard, American Express, Discover, and Diner's Club. There are other cheque processing companies trying to penetrate the market, like Euro Card, JCB and ATM companies, but credit cards still account for over 90% of all e-commerce transactions.

Different credit cards serve for different purposes. Visa and Master cards are bank cards issued though banks that are easy to get and tend to be accepted just about everywhere. Charge card like American Express and Diner club are entertainment. Department store card issued by each store individually, and petrol cards have terms of agreement that vary according to each company.

Credit cards are a widely used source of convenient credit for restaurants, hotels, mail order, on-line shopping, filling stations, grocery stores, dental and medical care, church bazaars, as well as telephone and television advertised products. There are many advantages of using credit cards, but the consequences of misuse can be drastic and painful.

Advantages

- International transaction
- Make payment easy
- No need of carrying money
- Places that are suspicious of personal checks often take credit cards.
- Credit cards eliminate the need to carry large sums of cash.
- If move to a new place, credit cards give purchasing power until establish yourself as a good risk in a new community.
- Credit cards can help coordinate receipts for tax purposes
- Bookkeeping is reduced to one monthly bill as opposed to checks.

Disadvantages

- Adding monthly interest charges means pay more for the goods and services.
- Consumers often have more than one credit card and each one has a credit limit. When the credit limits for all cards are added up, the total can be in the thousands of dollars/rupees. Consumers can fall into the habit of using credit cards to extend their income.
- Credit cards are easier to use than applying for loans even when a loan from a credit union, bank or other financial institution may provide the funds at a lower interest rate.
- Some people have been swindled by giving their credit card numbers to dishonest salespeople over the phone.

Once difference with a credit card is that a credit limit is set and customer is advised on this and then agrees that he will not exceed this ceiling. Where a credit is issued to joint account holders the undertake joint and several liability and agree that in the event of the death or bankruptcy of either of them, or upon breach of the terms of issue, the whole amount outstanding shall be due. And other feature of credit card is that when the card is issued or renewed, usually annually, some companies charge a fee.

1.1 Research Problem

Using credit cards has become a part of everyday life in the 21st century. Some people do it for the convenience of not carrying cash; others use it to purchase items that they cannot afford at present. In fact, presently Sri Lankan People in different economic and societal layers use credit cards. Therefore, to discover the social factors affecting usage of credit cards would downsize the difficulties rising during the process of computing probability associated with future usage of credit cards, mainly for the commercial banks and other related institutions, in making business expansion decisions.

1.2 Significance of the Study

With the current complex life style most of people have turned to use credit card than money transaction. But another proportion of people in the society still do not use these credit cards for their day today economic activities. Then for this separate usage of credit cards, number of factors can be affected such as economic, social and demographic.

Commercial banks have to face with fierce competition in their business. As a result of that they use

various modern techniques not only to achieve a higher profit but also to satisfy their customers. In this process credit cards play a significant role.

Although, there are number of studies done internationally regarding credit cards. But Sri Lankan situation is totally different. There are considerable amount of studies related to various sections in the banking process. Although credit card is a recent trend, there are lack of studies done on usage of credit cards. Therefore findings of this study would provide valuable information to business policy makers and planners of their decision making process. On the other hand, this will help commercial banks, customers and other people, who are interested in this field.

2. LITERATURE REVIEW

2.1 History of the Credit Cards in the world.

Albeit that merchant credit may be as civilization itself, the credit card industry originated in the 19 th centuries. The first credit cards originated in the United States during the 1920s. Enjoying the booming economy of the era and hoping to attract more customers, individual companies began issuing cards to their customers that would allow them to make purchases at the store or company and pay the money back later. While these cards could be used only at the store that issued them, some companies began accepting each other's credit cards during the late 1930s. This was the first use of third-party payment, where the company that issued the card would pay the merchant that accepted the card. The customer would then pay back the card-issuing company. Third-party payment would later become the primary operating method of bank credit cards.

In1950, Diners Club and American Express launched their change cards in the USA, the first "plastic money". A card that could be accepted by not just one merchant but many merchants who have aged to join this particular acceptance network, The Diners Club was intended to target a new class of social élite to offer customers the ability to charge expenses generally related to travel, dining and entertainments.

Out of California in the late 1950s, the bank of America issued their first credit card. In 1951, the 1st bank credit card appeared in New York's Franklin National Bank for loan customer. Only the bank's account holders also could use it. The cards could be used for a variety of retail purchase in the New York Metropolitan area. Due to banking restriction at that time, most banks could not operate outside, of their home state.

In 1951, Diners Club issued the first credit card to 200 customers who could use it at 27 restaurants in New York. By 1951 there were 20,000 Diners Club cardholders. A decade later, the card was replaced with plastic. Diners Club purchases were made on credit, but it was technically a charge card, meaning the bill had to be paid in full at the end of each month.

By the late 1950s, many banks and merchants were beginning to recognize the value of plastic credit cards .For merchants, accepting card resulted in fewer instance of fraud or processing errors and customers tended to spend more when using credit cards. For banks, credit cards were a source of constant revenue via interest charges to customers and loan coverage fees paid by merchants.

In 1958, American Express introduced the "Don't leave home without it" card. However, the Bank of America issued the first revolving-credit card in the State of California. Bank of America created the Bank Americard in 1958, a product which eventually evolved in to the VISA system ("chargex" also become VISA).

In 1959, the Bank of America issued the first truly universal credit card that garnered widespread merchant support. In 1959, the option of maintaining a revolving balance was introduced to Master card. While this carried the risk of accumulating finance charges, it gave customer greater flexibility in managing their money. Furthermore, Master cards come to being in 1966 when a group of credit-issuing banks established Master charge.

In 1966, a national credit card system was formed when a group of credit-issuing bank joined and created the Inter Bank card Association, according to Master card. This organization computes directly with a similar VISA program.

Leading retail banks in Europe propose to introduce compatibility for their cash card and credit cards. This would involve 40 banks from 17 countries and would initially extend to holders of cards issued by VISA, Euro Card, and MasterCard and so on. In November 1987 European commission institute an enquiry in to this proposal.

It was established in 1865 as The Hong Kong and Shanghai Banking Corporation Limited. Now it became HSBC Group. HSBC Bank Nevada is a subsidiary of HSBC Bank USA. It has 9,500 offices in 76 countries and territories in Europe, the Asia-Pacific region, the Americas, the Middle East and Africa all operates online. HSBC provides a comprehensive range of financial services: personal financial services; commercial banking; corporate, investment banking and markets; private banking; and other activities.

HSBC is one of the world's leading issuers of HSBC MasterCard products. A credit card with sophisticated services and a global presence; HSBC has what you need. Their credit cards offer competitive rates, attainable cash back and travel rewards, value-added benefits and so on.

2.2 History of the Credit Cards Sri Lanka

Following the technological advances throughout the world and also the gradual deregulation of financial sector activities starting from late 1977,Sri Lanka has taken many steps to create a more dynamic and innovative banking industry. One such step was the introduction of credit cards which marked Sri Lankan's first more towards a cashless society.

Credit cards were introduced for the first time in Sri Lanka in the early 1980s, by a private company. The card was named the "Golden Key Credit Card". Its usage was initially limited due to the limited recognition of the cards, difficulties in convincing customer and merchants of the benefits of using plastic money and also the lack of awareness of the people about credit cards.

However, commercial banks began issuing credit card in the 1980s, along with the introduction of arrange of new financial instruments. These were initially for local transaction only. With the liberalization of the current account following the acceptance of Article viii status of the IMF by Sri Lanka in 1994, bank began to issue global access credit card as well. The popularity of credit card with the public has increased rapidly with greater awareness of their advantages. Various facilities and benefits offered by the credit card issuing banks, together with aggressive advertising campaigns, have also helped to popularize credit cards.

In Sri Lanka, six domestic banks and three foreign banks presently issue credit cards, and such issues are made under famous international trade names, such as VISA and Master Card. At present there are several types of cards issued by these banks e.g., "Classic" cards, "Gold" cards and "Business" cards. Some of these cards are valid internationally as well as locally, while some are valid only for local transactions.

The use of credit cards is becoming popular in Sri Lanka. While there are many advantages associated with the use of these cards, there are also disadvantages, such as card users becoming excessively indebted and there by facing financial distress.
The Hong Kong and Shanghai Banking Corporation Limited (HSBC) is a very strong global financial services brand operating for over 115 years in the Sri Lankan banking sector.

Credit cards, which are also technically termed as plastic money, is fast gaining momentum through breath and width of Sri Lanka both in urban and rural areas. A local conglomerate founded the local card industry about 25 years ago. This card was primitively basic and devoid of any technical features that go with credit cards in the present day context. It did not take long for international banks based in the country as well as local banking giants to take the cue and step into the credit card industry in a huge leap.

ABC Credit Card Company, a wholly Sri Lankan owned company, ventured in to this highly competitive market pre-dominated by the foreign and local banks with a range of truly indigenous cards namely Silver, Gold and Platinum to suit every individual of different income levels with same state-of-the-art technology that is used by mega international Credit Card franchises. Most significant feature in this truly Sri Lankan card is that it is tri-lingual thereby breaking all communication barriers endemic to the local culture, which prevented many people from owning a Credit Card.

2.3 Research on Credit Cards

Krannert Graduate School of Management (Purdue University) did the study of Factors Affecting the Growth of Bank Credit Card and Check-Credit (1977). These researchers suggest that credit-card and check-credit outstanding per capita are elevated in states where consumer real income and bank wages are high and unemployment variance is low.

The research of R. Suttichaiyakul on credit card related crimes, has shown that the important factors describing behaviour of credit card related crime are the ratio between credit card revenue and total revenue of business firm, the entry condition to be as a credit card member, educational level of business owner, experiences in seminar conducted by commercial bank, age of business owner and sex. The conclusion is that the business firms with higher ratio of credit card revenue and total revenue, lower educational level and age, male owners who have entry condition to be as a member through selection and invitation of the commercial bank and the business owners who have experiences in seminar conducted by the bank trend to have more credit card related crime than the other.

Bryant (1990, p. 80) offers a detailed explanation to show that borrowing is the transfer of future resources to the present to increase current consumption. Under a budget constraint, consumers make borrowing decisions to maximize utility. In addition to consumption needs and a budget constraint, the cost of goods and consumers' time preference can also influence the substitution between current and future consumption. Consumers are assumed to

weigh the cost of buying goods in the present against the expected future cost of goods and choose the cost minimizing consumption (Bryant, 1990, p. 86). In credit markets, interest rates represent the cost of goods. This cost is likely to motivate consumers to change their equilibrium choices between current and future consumption by borrowing or saving money. Time preference is the desire by consumers to rearrange consumption over the lifetime (Bryant, 1990, p. 87). A consumer's willingness to borrow is what Bryant calls the pure time preference effect on household debt. This willingness to borrow is reflected by psychological factors related to credit. Adapting the life cycle model and Bryant's exposition to credit card use produces the following proposition. Credit card payment behaviour and the outstanding credit card balance are affected by:

1. Consumption needs,
2. Current resources (the budget constraint) and future resources,
3. The interest rate, and
4. The consumer's preferences

Since little research has been conducted on the outstanding credit card balance, this study reviews previous research to identify the factors that determine the outstanding credit card balances.

According to the study of Factors Related to Credit Card Use and Outstanding Credit Card Balances - Consumption Needs, a consumers' age, marital status, and household size might influence being a credit card revolver. A consistent finding in previous studies is the negative relationship between age and being a credit card revolver (Bei, 1993; Canner & Cyrnak, 1985; Choi & DeVaney, 1995; Steidle, 1994; Wasberg, Hira & Fanslow, 1992). This finding implies that households headed by a younger individual are more likely to use credit cards as borrowing instruments than households headed by an older individual. Canner and Cyrnak (1985) showed that marital status is important in explaining who is a revolving credit card user. Kinsey (1981) and Steidle (1994) also found that marital status was related to credit card possession and use. Consumers who are married are likely to have higher expenditures than non-married consumers. Godwin (1998) showed that household size was positively related to the increase in household debt. This finding supports the beliefs that demand for present consumption is positively associated with household size. Thus, the need to finance a larger amount of living expenses could be reflected in borrowing money from credit cards.

The relationship between education and credit card use has not been consistent in previous studies. Bei (1993) and Steidle (1994) showed that education was negatively related to being a credit card revolver. Canner (1988) found that both higher educated and lower educated people were revolvers as opposed to convenience users. The majority of the revolvers (60%) held less than an 8th grade education in his study. However, theoretically, education is considered as one of the human resources. Education can increase the demand of current consumption. According to Becker (1975), education can be a future resource, as well as a current human resource. High future resources suggest that high future income is likely to increase the demand for consumption and for borrowing more money in the Determinants of Outstanding Balances among Credit Card Revolvers, 2001, Association for Financial Counselling and Planning Education, 69 current periods. Empirically, Choi and DeVaney (1995) found that education was positively related to credit card use.

Similar to the effect of current income, the amount of net worth can determine a household's level of consumption (Bryant, 1990, p. 80). If net worth is constrained, consumers can borrow money from credit cards to meet their needs and wants. According to Duca and Whitesell (1995), the amount of liquid assets can be an important indicator of consumers' repayment patterns because consumers with substantial balances of liquid assets can decide whether they want to revolve their bill or pay cash. Households with high liquid assets are more likely to pay their debt in full each month (Canner & Cyrnak, 1985; Zhang & DeVaney, 1999).

Credit cards allow the cardholder to access to credit similarly; a higher credit limit allows the cardholder to borrow more money using credit cards. For revolving credit card users, more credit cards provide access to more credit sources. Obviously, more credit sources can lead consumers to borrow more money (Canner & Cyrnak, 1986; Kinsey, 1981; Lee & Hogarth, 1998). Hanna, et al. (1995) simulated an optimal life cycle model related to expected real income growth at the household level. They showed that rational consumers are more likely to consume and disserve if they expect positive income growth. Fan, et al. (1993) found that rational consumers who expected high real income growth should consume more than those with the same current income who expected lower income growth, so that future income growth should be related to borrowing. Godwin (1998) concluded from her empirical analysis that expectations for real income were positively related with an increase in consumer debt.

The study of Factors Related to Credit Card Use and Outstanding Credit Card Balances – interest rates, the interest rate and the payment pattern ultimately determine the balance (Duca & Whitesell, 1995). Canner and Luckett (1992) found that credit card revolvers were more likely than convenience users to be sensitive to the level of interest rates. Lee and Hogarth (1998) examined credit card interest rates

associated with search for information about interest rates. Although a low interest rate may not be a concern to convenient users of credit, credit cards revolvers are likely to prefer a low interest rate. And also consumer preferences to use credit show their willingness to borrow, and this is based on psychological factors (Zhu & Meeks, 1994). According to Godwin (1998), a consumer's preference regarding the use of credit is considered the motive for choosing between present and future consumption. Ajzen and Fishbein (1980) showed that attitude could be used to predict behaviour. According to the theory of reasoned action, holding a specific attitude is associated with a specific behavioural intention.

Although many studies have examined the relationship between attitude toward credit and credit card use, the results have varied. Bei (1993), Canner and Cynark (1986), and Steidle (1994) found a significant relationship between having a positive general attitude toward credit and revolving credit card use. In a study of low-income consumers, Zhu and Meeks (1994) did not find a significant relationship between general attitude and credit behaviour. However, Chien and DeVaney (2001) used an index to measure favourable attitudes for specific uses of credit and found a positive relationship between the index and the outstanding credit card balance. Thus, examining both general attitude toward credit and specific attitude toward credit could be a more accurate measurement of attitude toward credit.

Using the 1998 Survey of Consumer Finances, the study of The Determinants of Outstanding Balances among Credit Card Revolvers, examines the factors affecting outstanding credit card balance among revolving users of credit cards. Four sets of factors based on the life cycle model, Bryant's exposition of household consumption and saving behaviour (1990 pp. 78-114), and previous studies are applied to the outstanding credit card balance: consumption needs, resources, interest rate, and preference factors. In addition, Higher education, higher income, higher real assets, more credit cards, higher credit card interest rates, a positive attitude toward credit, found to increase the amount of the outstanding credit card balance. Among revolving credit card users, an increase in education increases the amount of outstanding credit card balances. An increase in income and real assets can also increase the amount of the outstanding credit card balance as consumers borrow to smooth consumption needs during their lifetime. (Haejeong Kim and Sharon A. DeVaney)

Study of Determinants of Merchant Participation in Credit Card Payment Schemes is found that a merchant's personal background, type of business and total value of sales are significant in determining a merchant's acceptance of cards in payment transactions. Further, it is found that customers' usage of credit cards and other merchants' acceptance of credit cards in payments have a significant influence on a merchant's decision. Findings also indicate that non-pecuniary strategic factors are stronger drivers and barriers to a merchant's participation in credit cards payments services compared to monetary related factors (Yiing Jia Loke).

Henry, Weber, and Yarbrough (2001) are found from the study of Credit card attitudes and behaviours of college students have shown that college students are greatly involved with credit cards. The research indicated mixed practices of college students' credit use and a low level of knowledge regarding credit. Based on the assumption that one's attitudes affect behaviour obtaining information on the factors affecting college student's credit card behaviour offers a solid first step to improving college students' credit card behaviours

Researcher found that credit card debt and debt stress are good ways of tapping into how socio-economic factors affect health," Drentea said. "Researchers have long known that income, education and occupation are key socio-economic factors related to health. These health measures were then compared to responses on a debt stress index. This index, designed by Lavrakas, asked participants how much they worried about their total debt. The study found a strong relationship between debt stress and health. In addition, the health indicators were compared to a variety of measures related to actual credit card debt, including the number of charge cards the participants used, and whether they carried a balance from month to month. However, the findings showed that the only factor related to health was the ratio of credit card debt the participants owed to their total family income. Debt stress may be particularly important because the study showed it plays a role in health over and above the debt-income ratio, Lavrakas said. In other words, the amount of debt a person has and their debt stress play an additive role, each contributing to worsening health.

According to the latest study of L. Mattson et al, balances from month to month, 27 percent of students with credit card debt have balances in excess of $3,000 (Nellie Mae, 2001). Further, a study by Staten and Barron (2002) found the delinquency rates on both student and young-adult accounts are higher than those for account holders age 25 and older. Irvine (2002) indicates that the growth of credit card debt has financial experts worried because bankruptcies filed by those under age 25 hit a record high in 2000. Irvine also observed that graduating from college could mean having to face tens of thousands of dollars in debt (Irvine, 2002). In "Plastic: Handle with Care," Wyatt (2002) observed that

even with increasing tuition, parents send kids off to college with high-interest-rate credit cards. Both higher tuition and high credit card rates increase the total cost of college for parents. Iowa State University Associate vice Provost Tahira K. Hira noted that students do not understand the effects of unpaid credit card bills on their well-being (Wyatt, 2002). A June 2001 General Accounting Office survey of 100 officials at 12 colleges including directors of financial aid, directors of counselling services, and student affairs vice presidents found that consistent misuse of credit cards by students, combined with student-loan debt, could lead to substantial debt burdens that "could become particularly severe after graduation, when many students must begin making payments on education loans" (GAO, 2001, p. 3).

Two subsequent studies suggest many college students have fairly positive views toward credit cards, although these attitudes may become less positive over time. Hayhoe et al. (1999) found that students with no credit cards were more likely to score lower on the affective credit attitude than students with credit cards. Students with four or more credit cards were more likely to score higher on the cognitive credit attitude than students with one through three credit cards. In a follow-up with some of the students two years later, Hayhoe (2002) found that 40% had lower affective credit attitude scores and 35% had higher affective attitude scores. Those who had graduated had lower affective attitude scores. (Celia Ray Hayhoe [1], Lauren Leach [2], Myria W. Allen[3], and Renee Edwards[4]).

3. METHODOLOGY

This study mainly aimed to identify the social factors affecting the usage of credit card and intendancy to use credit cards in future. Additionally, to identify the existing facilities and to analyze the problem of the credit card were also targeted. The research was based on data collected from university staff members through a questionnaire. A simple random sample of 200 academic and non-academic staff out of total of 429 staff of Sabaragamuwa University was selected and then it was about 50% of the population. Sample consists of 80 academic and 120 non-academic staff.

The variables included in the model were:

- Gender
- Age
- Race
- Education level
- Occupation
- Religion
- Residency
- District

The basis of selecting these variables was that they are the major demographics which must be considered in a study on usage of a prestigious product like credit card.

A proper statistical analysis was performed on data using MINITAB 14 and SAS programs. A binary logistic regression models were fitted in order to identify the important factors influencing usage of credit card.

Data become binary when each observation can take only one of two possible values, such as diseased healthily, defective or non-defective and success or failure.

3.1 Binary Logistic Regression Model

A binary logistic regression model was used to analyze the likelihood of using a of credit cards given some selected factors. The explanatory variable can be qualitative (dummy variable) quantitative or may be both type. In addition the parameter β_i reflect the effect of x_i on the log odds that y=1, controlling for other x's. To obtain the corresponding odds ratio exp (β_i) is taken.

The Logit model for the usage of credit cards including all the explanatory variables can be expressed as follows:

$$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_j^{\text{Age}} + \beta_k^{\text{Race}} + \beta_l^{\text{Education level}} + \beta_m^{\text{Occupation}} + \beta_n^{\text{Religion}} + \beta_o^{\text{Recidency}} + \beta_p^{\text{District}}$$

The Logit model for the tendency to use credit cards including all the explanatory variables is:

$$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_j^{\text{Age}} + \beta_k^{\text{Race}} + \beta_l^{\text{Education level}} + \beta_m^{\text{Occupation}} + \beta_n^{\text{Religion}} + \beta_o^{\text{Recidency}} + \beta_p^{\text{District}}$$

4. RESULTS

The composition of the sample according to the type of the credit card is given in Figure 1. The pie chart says that Master Card and HSBC Classic are the credit cards which are most highly used by university academics.

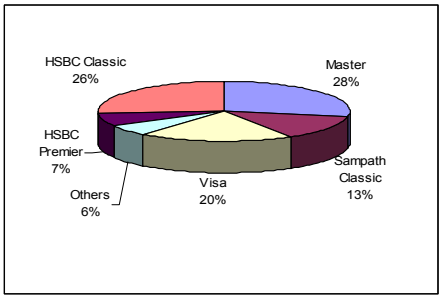

Figure 1: Usage of Credit Cards

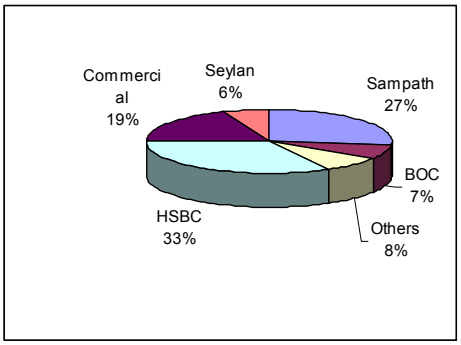

Figure 2: Usage of Credit Cards of Different Banks

According to the Figure 2 Sri Lankan univerity staff has a high tedency of using credit cards issued by Sampath and HSBC.

Table 1 gives the transactions made by university employees through a credit card. Buying food and beverage is the most popular transation. Not only for university staff but also for many other credit card users this could be the same and indicated by the larger crowds in retail super markets.

Table 1: Transactions made by Credit Cards

Transactions	Quantity (%)
To buy food and beverage	78.67%
To buy clothing and ornaments	16.67%
To pay other bills	27.27%
Filling fuel	29.63%
Lack of money	35.71%
Others (to pay hospital bills, so on)	5.88%

4.1 Models to the Usage of Credit Cards

The detailed procedure of fitting a binary logistic regression model to the usage of credit cards by university employees is described below.

$\text{Logit}(\pi) = \alpha$

Model with only intercept

This is called null model. This is significant. This is not a good model since in this model there is no explanatory variables are included.

Models with one variable

Logistic models were fitted with each predictor variable. This was done in order to check relationship of usage of credit card and each covariate separately. The significant models were:

$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}}$
$\text{Logit}(\pi) = \alpha + \beta_j^{\text{Age}}$
$\text{Logit}(\pi) = \alpha + \beta_k^{\text{Race}}$
$\text{Logit}(\pi) = \alpha + \beta_l^{\text{Education level}}$
$\text{Logit}(\pi) = \alpha + \beta_m^{\text{Occupation}}$

Above models are significant. That means variables: gender, age, race, education level and occupation have significant relationships with usage of credit cards, when considering individually. Moreover, other explanatory variables are not significant. In other words, there is no effect of the explanatory variables of residency, district, religion with credit card when considering individually.

Models with two variables on usage of credit cards

In the second stage of the analysis, following models were fitted with two explanatory variables. Then following models were found significant.

$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_m^{\text{Occupation}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_k^{\text{Race}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_n^{\text{Religion}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_o^{\text{Residency}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_l^{\text{Educational level}}$
$\text{Logit}(\pi) = \alpha + \beta_k^{\text{Race}} + \beta_o^{\text{Residency}}$
$\text{Logit}(\pi) = \alpha + \beta_k^{\text{Race}} + \beta_l^{\text{Educational level}}$
$\text{Logit}(\pi) = \alpha + \beta_k^{\text{Race}} + \beta_j^{\text{Age}}$
$\text{Logit}(\pi) = \alpha + \beta_n^{\text{Religion}} + \beta_o^{\text{Residency}}$
$\text{Logit}(\pi) = \alpha + \beta_n^{\text{Religion}} + \beta_l^{\text{Educational level}}$
$\text{Logit}(\pi) = \alpha + \beta_n^{\text{Religion}} + \beta_m^{\text{Occupation}}$

Models with three variables on usage of credit cards.

Following models with three explanatory variables were significant.

$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_n^{\text{Religion}} + \beta_p^{\text{District}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_n^{\text{Religion}} + \beta_o^{\text{Residency}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_n^{\text{Religion}} + \beta_l^{\text{Educational level}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_n^{\text{Religion}} + \beta_m^{\text{Occupation}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_k^{\text{Race}} + \beta_p^{\text{District}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_k^{\text{Race}} + \beta_o^{\text{Residency}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_k^{\text{Race}} + \beta_l^{\text{Educational level}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_k^{\text{Race}} + \beta_m^{\text{Occupation}}$
$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_m^{\text{Occupation}} + \beta_j^{\text{Age}}$
$\text{Logit}(\pi) = \alpha + \beta_k^{\text{Race}} + \beta_o^{\text{Residency}} + \beta_j^{\text{Age}}$
$\text{Logit}(\pi) = \alpha + \beta_n^{\text{Religion}} + \beta_m^{\text{Occupation}} + \beta_j^{\text{Age}}$
$\text{Logit}(\pi) = \alpha + \beta_n^{\text{Religion}} + \beta_m^{\text{Occupation}} + \beta_j^{\text{Age}}$

Any model with four, five, six, seven and eight explanatory variables not significant. Model with all eight explanatory variables individually (except interaction terms) is called non-saturated model. It was found that this model is also not significant, and then all one-way interaction terms were added to the non-saturated model separately. There was no significant

interaction term found. Therefore any of those model could not be considered as the best model. Subsequently, all models with different number of variables were fitted with respective second order interaction terms. Stepwise procedure selected only the following model as significant.

$$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Gender}} + \beta_m^{\text{Occupation}} + \beta_j^{\text{Age}} + \underset{\text{Age*Gender}}{\beta_{ij}}$$

Therefore, the above model was selected as the best fitted model representing the relationship between credit card usage of university employees and the socio-economic factors considered. The model with its coefficients as follows.

$$\textit{Logit}(\pi) = -4.7114 + 6.8029D_i - 1.5435D_j + 0.01503^{Age} - 0.1639^{Age*Gender}$$

Where,

X is age,

$$D_i = \begin{cases} 1; & \text{If gender is r} \\ 0; & \text{Other} \end{cases}$$

$$D_j = \begin{cases} 1; & \text{If occupation is non-academ} \\ 0; & \text{Other} \end{cases}$$

The best model, the deviance value is 1.1999.A large value of deviance indicate current model has to be improved. The likelihood ratio (LR) statistic is used to test the adequacy of the fitted model. The low probability associated with LR implies that the fitted model is adequate and these variables should be included in the model.

In other words the estimated the odds ratio, the goodness of fit tests for the model indicated that the Likelihood ratio (LR) statistics is 236.5241, which has a probability value of less than 0.05. Thus, the null hypothesis is rejected and this concludes that the model fits the data well. Hence, it could be concluded that the model developed here is a good fit model.

4.2 Odds Ratio

Coefficient exp β represent the odds ratio associated with, one unit increases in the value of explanatory variable.

Odds ratio for non-academic relative to academic staff

$$= \exp(\beta_i^{\text{non-academic}})$$
$$= \exp(-1.5435)$$
$$= 0.2136$$

The negative coefficient of -1.5435 and the odds ratio of 0.21 indicates that academics tend to use credit cards for their transactions than non-academics. Given that subjects of same gender and in same age, the odds ratio can be interpreted as the odds of using credit cards by non-academics is being 21% of that of academics.

4.3 Model Fitted for the Intendancy to Use a Credit Card in Future

The null model

This is not a good model, since in this model there is no explanatory variables are included.

$$\text{Logit}(\pi) = \alpha$$

Models with one variable

This can be obtained in order to check relationship of usage of credit card in the future and each covariate separately. From all such models, following model was significant.

$$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Education level}}$$

Significance of the model means that educational level has a relationship with future usage of credit cards. In other words, there is no relationship of the explanatory variables: gender, race, residency, district, religion occupation, age, on the intendancy to use credit cards in future.

Models with two variables

Then other explanatory variables were added and had the models with two independent variables. The significant model was,

$$\text{Logit}(\pi) = \alpha + \beta_i^{\text{Education level}} + \beta_j^{\text{Age}}$$

It means that the education level and age influence on future usage of credit cards.

Model with three variables

Subsequently, the models with three explanatory variables were considered and they were not significant. Similarly, the models with four, five, six, seven variables and non saturated model were not significant.

When the interaction terms were added to the non-saturated model, none of the interaction terms found significant.

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The Best Model

Considering all the models, the following model was identified as the best model.

$$\text{Logit}(\pi_{ij}) = \alpha + \beta_i^{\text{Education level}} + \beta_j^{\text{Age}}$$

The fitted model with actual values of coefficients was,

$$\textit{Logit}(\pi) = -21.47 + 26.75D_1 + 23.21D_2 + 24.93D_3 + 24.10D_4 - 0.12^{Age}$$

Where,

$D_i =$
- 1 if passed grade 8
- 2 passed O/L
- 3 passed A/L
- 4 graduates
- 0 otherwise

The deviance value was 1.0813, and this value is close to one. In addition, the LR statistic was larger than χ^2 critical value. Therefore above explanatory variables were included in the model.

The odds ratios are interpreted in the following way.

Log odds ratio for age = β_j^{Age}
Odd ratio for age = $\exp(\beta_j^{\text{Age}})$
= exp (0.1503)
= 1.162

Coefficient of β represents the odds ratio, associated with one unit increase in the value of age.

Log odds ratio for Education level = $\beta_l^{\text{Education level}}$
Odds ratio for Education level = $\exp(\beta_l^{\text{Education level}})$

Odds ratio for passed grade 8 relative to passed the O/L
= $\exp(\beta_l^{\text{Passed O/L}} - \beta_l^{\text{Passed grade 8}})$
= exp (23.2058 - 26.7476)
= exp (-3.5418)
= 0.029

Odds ratio for passed grade 8 relative to passed the A/L = $\exp(\beta_l^{\text{Passed A/L}} - \beta_l^{\text{Passed grade 8}})$
= exp (-1.8222)
= 0.16

Odds ratio for passed grade 8 relative to graduates = $\exp(\beta_l^{\text{graduates}} - \beta_l^{\text{Passed grade 8}})$
= exp (-2.644)
= 0.07

Odds ratio for passed A/L relative to passed O/L = $\exp(\beta_l^{\text{passed O/L}} - \beta_l^{\text{Passed A/L}})$
= exp (-1.7196)
= 0.18

Odds ratio for passed graduates to passed O/L
= $\exp(\beta_l^{\text{passed O/L}} - \beta_l^{\text{Graduates}})$
= exp (- 0.8978)
= 0.41

Odds ratio for passed graduates to passed A/L
= $\exp(\beta_l^{\text{passed A/L}} - \beta_l^{\text{Graduates}})$
= exp (- 0.8218)
= 0.44

5. CONCLUSIONS

All the major conclusions made by the study entirely depend on results given by the binary logistic regression models fitted in the data analysis. According to them, the major socio-economic factors which have an impact on the use of credit cards are: age, gender and occupation. In the case of social factor "age", the people who mostly use credit cards belong to 29 - 40 years age group. Thus it seems that most people tend to use credit cards instead of paper money when they reach the age of young men and women. Furthermore it was found that people who are under the age of 28 years are interested in using credit cards in the future. On the other hand, there is a little tendency that people aged above 45 years use credit cards, because of unwillingness and risk of running in to debt. The "gender" also plays a vital role in the use of credit cards and men comparatively tend to use credit cards than women. Here it was revealed that the prominent reasons for their more use of credit cards are,

- easiness in transactions and
- being unnecessary to carry money

It was also revealed that for women following reasons are the prominent for the less use of credit cards.

- They used to economize
- Unwillingness to run in to debt
- Attitude of unnecessary

Findings of this study and previous studies imply that the relationship between age and being a credit card user is negative. Also there is a combined effect of age and gender on credit card usage. In the investigation of intendancy to be future users of credit cards, the factors: age and educational level found as the major factors.

Occupation is also one of the influencing factor and it was found that the academics tend to use the cards more than non-academic personnel. Most of the aca-

demic staff has higher educational qualifications and they live in urban or sub urban areas. Thus, although education and residence do not have a direct impact on credit card usage, they affect indirectly. Moreover, many of Sabaragamuwa University non-academics live in areas of Ratnapura district in which there is less opportunity for credit card transactions.

Apart from that, the other factor which contributes to the use of credit cards in future is the level of education. Here it was revealed that those who possess a high level of education are more interested in the use of credit cards in future.

Following minor conclusions on the usage of credit cards by university employees were also been able to come up with.

- The mostly used credit card is the Master Card.
- The mostly used credit card is issued by the HSBC.
- Credit cards are mostly used to buy food and beverages, clothing and fuel for vehicles
- Mostly, customers make only the minimum monthly payment.
- The majority are satisfied with the use of credit cards.
- Most people are aware of the use of it and the majority are in the opinion that the rate of interest is extremely high and not reasonable.
- People views that the major advantage of credit card is making payment easy. No need of carrying money is also a prominent advantage of the credit cards.
- People face difficulties such as loss of the credit card, use of invalid card, and faults in the ATM network, when using a credit card.

6. IMPLICATIONS TO THE PRACTITIONERS

It is more important to have further expansions of business institutions facilitating transactions through credit cards. Already there are number of institutions having credit cards facilities in Sri Lanka. But most of them are well organized institutions including super markets, banks etc. This might be the reason behind using credit card by the majority to buy food and beverages. This implies that it is vital to move to credit cards for all types of businesses. In order to sustain in this knowledge economy, it is essential to cater knowledge workers and educated people. Therefore introducing credit card facility in every business is important since educated people more tend to use credit cards as this study found. It is also important to increase the awareness of general public regarding credit cards due to that the system of using credit card is somewhat a complex process. Most people are not familiar with this procedure and therefore it is more important to give right knowledge and instructions to the general public. It is more important to increase the number of banks which are issuing credit cards. Currently a few number of commercial banks are issuing credit cards. If all banks can connect with the system of credit cards, people can entertain more and more conveniences. As a result of that, people will be able to receive all banking services at a single place. A lot of people views that interest on credit cards is not affordable and should be reduced. If relevant institutions take necessary actions to reduce these rates, it will attract a large number of additional customers and consequently, will maximize profits of organizations. Not only credit card is a way of increasing profits of organization, but also a process of providing an identity to the customer because it facilitates sharing of information throughout the supply chain.

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