

How Individual's Characteristics Influence the Use of Credit Cards in Sri Lanka: A Probit Model Analysis

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Abstract

Credit cards have become the most critical payment method for global consumers. Credit card payments are initiated in developed countries and spread to the developing countries in the world particularly to Sri Lanka in late 1989. Sri Lankans' credit card consumption has negative growth due to the traditional attitudes like "save first and spend later" during past decades. As per the global findex database, only 5 percent of the Sri Lankan population had ownership of a credit card in 2017. The study argues that individuals' characteristics could impact the ownership of a credit card in Sri Lanka. Thus, this paper aims to analyze the factors influencing the use of credit cards in Sri Lanka using the World Bank's findex database. A probit model approach is used to examine the marginal effect of individuals' characteristics on the decision to use credit cards by consumers. The results indicate that an Individual's characteristics of gender, age, income, education, and employment are the determinants of credit card ownership. Age has a non-linear relationship and Female are less like to have credits cards. The findings further revealed that higher education level, higher income level, and employment are more likely to have credit card ownership in Sri Lanka.

Keywords: *Credit card, Individuals' characteristics, Probit regression model, Sri Lanka.*

1. Introduction

Credit cards have become a highly relevant payment method worldwide, initiated in developed countries, and rapidly introduced to the developing nations, including Sri Lanka (Kuruppuge et al. 2017; Gan et al., 2016; Wang et al., 2011). Globally, 23 percent of adults reporting formal borrowings use credit cards. Although 49 percent of high-income economies used a credit card in 2017, only 8 percent of adults in developing economies tend to use a credit card (Global Findex Database, 2017). Commercial banks in Sri Lanka first introduced credit cards in 1989, following the free and open economy concept. As shown in the World Bank global financial inclusion data, Sri Lanka's credit card ownership is only 5 percent, even though 74 percent of the population owns a bank account. The total number of credit cards used in 2017 was 1435053, and it is a 13.5 percent increase compared to 2016 (CBSL, 2017). Credit cards become increasingly important to people as they offer several benefits for consumers. Those benefits include a reduced need to carry cash, the availability of an accurate record of purchases, and documentation of a history of creditworthiness (Soll et al., 2013). Traditional attitudes like "save first and spend later" lead negatively towards the growth of credit card consumption by the people in Sri Lanka.

Scholars have made various attempts to determine the credit card demand in a country. Previous studies have assessed credit card demand via economic factors, demographic characteristics, and personal and institutional factors. The demographic factors and card features explain Malaysia's card spending behavior (Teo et al., 2013). Wang et al. (2011) used demographics, attitudes, personality, and card features to explain card debts in China. The credit card usage by consumers is high among young men due to significant factors such as avoiding carrying cash, security, and increased online purchasing and payments (Thompson & Worthington, 2009). Most of the significant studies available in previous literature pay considerable attention to the individual characteristics of gender, age, income, education, and employment.

When analyzing the developing Asian countries, an adaptation of credit card demand has become significant in countries like China and South Korea (Perera et al., 2016). The neighboring countries of India and Pakistan credit card market penetration show a declining trend in recent times. In India, credit

card holders only remain at 2 percent (Emerging Markets Payment Index, 2015). The credit card was first introduced in western countries, but currently, it has spread worldwide as a popular payment method. Much previous research focuses on the western part of the world, but some literature can be found in the Sri Lankan context (Gurugamage & Wickramasinghe, 2009).

The benefited parties of the findings are decision-makers in card-issuing banks and financial institutions to better understand people who use credit cards. In response to the gap in the current literature on credit card usage, this study aims to identify individuals' socio-economic factors that influence credit card usage in Sri Lanka. Therefore, this study examines the marginal impact of socio-demographic and economic characteristics (gender, age, income, education, and employment) on credit card usage in Sri Lanka. Based on the research objective, the research question of the study is derived as 'what is the marginal impact of socio-economic characteristics (gender, age, income, education, employment) on credit card usage in Sri Lanka?'

The rest of the paper is organized as follows: Following the introduction, the second section reviews the literature of the study, and the third and fourth sections explain the methodology and data analysis of the study. The final section provides concluding remarks and recommendations and future directions.

2. Literature Review

This section focuses on the theoretical and empirical findings on the impact of individuals' socio-economic characteristics on Credit card demand in Sri Lanka. The main objective is to analyze socio-economic characteristics on credit card demand using the global index database 2017. Based on the previous findings, the study's main argument can be developed as follows: The credit card has become a vital payment tool for consumers all over the world, both in developed and developing countries. A credit card is firstly introduced in developed countries and initiated in developing countries. In developing economies, the recent growth in credit card ownership falls only by 10 percent (Global findex index, 2014). Besides, numerous characteristics of individuals could affect the lack of credit card ownership in developing countries, particularly in Sri Lanka. The study argues that individuals' economic and

social characteristics could impact credit card demand in Sri Lanka. There are many ways of determining the credit card demand of a country. Credit card demand is influenced by significant social demographic and economic characteristics of individuals (Arpita et al., 2011). Many scholars have identified determinants such as age, gender, marital status, education level, income, and employment as the factors which influence the credit card demand (Baek & Hong, 2004; Hayhoe et al., 2005; Gan et al., 2016; Wang et al., 2011; Worthington et al., 2007; Christopher et al., 2016; Liqiong et al., 2019). The different scholars argue different types of factors have influenced the individuals' use of a credit card. Their findings revealed that several types of socio-demographic factors are associated with the decision to own a credit card. The previous empirical findings on the credit card demand more increasingly emphasized that the credit card demand of a country would be change with the socio-economic and demographic characteristics of income, age, gender, employment and education (Wang et al., 2011). The various scholars have focused their studies based on both the developing and developed economies and arise to interesting findings that address the relationship between variables.

The demand for a product can be simply defined as the willingness and ability of a person to purchase a product or service (Sexton, 2007). The individuals of a country have a need or attitude towards owning something by themselves to increase the demand for the product. Credit cards are a payment instrument, but it is a source of credit. 49 percent of adults in high-income economies have used a credit card in 2017 while in the developing economies only 8 percent tend to use credit cards (World Findex Database, 2017). Many previous scholars had argued that the intention of using a credit card could be able to predict using the individuals' socio-economic characteristics. The findings by Christopher et al. (2016) revealed that young, affluent Chinese credit card holders move towards paying with cards as it is more convenient and more accessible than cash. In terms of demographic factors, Christopher et al. (2016) found that the results provide evidence that younger age has a significant and positive impact on credit card ownership. A high level of education, a higher job position, and higher monthly spending will positively influence credit card ownership. The Chinese study, which focused on the determinants of credit card demand identified the main indicators of credit card demand as age, gender, and income.

The findings further investigated that Age is negative effects on card spending and card debt while Gender and income have different effects on card spending and debt, in which more males are owing cards compared to females (Liqiong et al., 2019). Li and Li, 2019 evaluated the demographic characteristics such as age, gender, and customer' income have a significant impact on credit card demand. The finding emphasized that credit card ownership is not related to the customer's income, but significantly related to the stability of his life and work. The finding moreover pointed out that commercial banks need to focus on the factors affecting customer life and work stability, and the income is only a reference factor.

The investigation employed socio-economic factors of age, gender, education, income, and employment to determine the credit card demand in the Sri Lankan context. As explained above, many previous scholars have investigated that the socio-economic characteristics may influence heavily on the credit card usage of individuals in a country. Several Chinese studies are more focused on the factors associated with credit card usage (Gan, et al., 2014; Sharpe, et al., 2012).

Age: Age is one of the most significant factors which impacts the consumers' intention towards owning a credit card on their own. Most previous findings revealed that age and credit card demand has a negative relationship, and younger consumers are mostly using credit cards (Kim & De Vaney, 2001; Christopher et al., 2016; Wang et al., 2011; Liqiong et al., 2019). They reported that young people have been using credit cards as they are more likely to spend more than older customers. A significant study evaluated that young consumers within the average age of 35 years and younger are spend more on the credit card than the more senior cardholders (Liqiong et al., 2019).

Gender: Gender of the individual can be taken as one of the most influencing explanatory variables used in predicting the credit card demand of a country. Many of the prior authors found that males have a high demand for credit card usage than females (Baek and Hong, 2004; Liqiong et al., 2019; Christopher et al., 2016). As per the literature, credit card users are more likely to be males than females (Khare et al., 2011). However, gender shows both negative and positive relationships by different authors. Many scholars argue that male

consumers are using credit cards more than female consumers.

Education: The education level of an individual can be emphasized as another most common variable used in the studies which focus on the relationship between the individuals' factors and credit card demand. The education level of a respondent enhances the efficient use of credit cards by the people in a country. The previous authors also argued on the relationship between education and credit card demand. As per Kim and De Vaney (2001), a higher education level has more chance of being a credit cardholder. They also emphasize that a positive relationship exists between highly educated people and higher card spending than less educated people (Christopher et al., 2016; Liqiong et al., 2019).

Income: Many of the scholars paid their attention to the income variable as it may heavily determine whether a person moves towards owning a credit card or not. The empirical findings suggested that income significantly affects credit card usage by consumers. More studies emphasized that upper-income consumers are more likely towards credit card usage than lower-income people (Kim and De Vaney, 2001). Previous studies reported that individuals' income is positively influenced by credit card demand (Christopher et al., 2016; Liqiong et al., 2019; Baek and Hong, 2004).

Employment: Employment is also a significant factor that influences credit card usage by consumers. Previous scholars have emphasized that unemployed people are less likely to have a credit card than employed people (Baek and Hong, 2004; Christopher et al., 2016; Liqiong et al., 2019). They also revealed that people in professional careers are more likely to use a credit card.

As per the above discussion, empirical findings, and previous literature, the following theoretical framework (Figure 1) has been developed to conceptualize the independent variables against the dependent variable. The independent variables are individuals' demographics and social and economic characteristics, and the dependent variable is the use of credit cards.

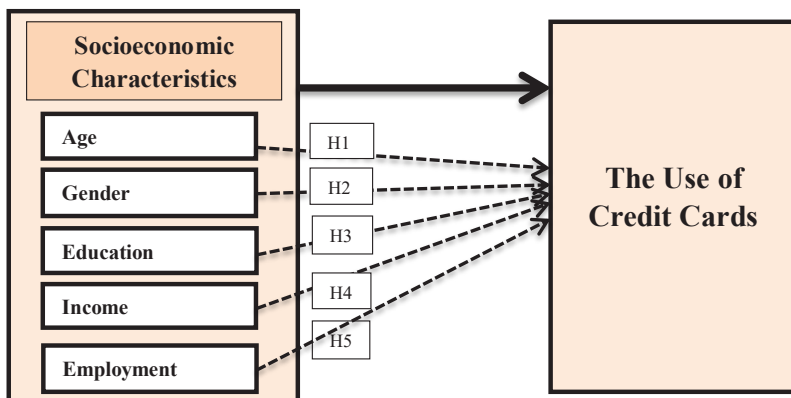


Figure 1- Conceptual Framework of the Study

3. Research Methodology

The present study used the World Bank's index database 2017 to examine the individuals' socio-economic characteristics influencing credit card demand in Sri Lanka. The study randomly selected individuals from the Sri Lankan dataset. It used the dependent variable of the use of credit card and independent variables of gender, age, education, income, and employment to analyze the relationship between individuals' socio-economic characteristics on credit card demand in the country.

This study's main objective is to analyze the influence of individuals' attributes on credit card usage. The respondents' answers were translated into a binary variable (0, 1) for both credit card usage and determinants—the sample framework of the study comprised individuals in Sri Lanka. From the 1104 individual cases, 1080 were used for further calculations after removing 24 missing values in data. Thus, the probit regression model was employed for data analysis using the following equation (Shihadeh, 2018).

$$Y = \alpha + \beta_1age_1 + \beta_2age_2 + \beta_3gender_1 + \beta_4education_1 + \beta_5income_1 + \beta_6employment_1 + \epsilon$$

Y represents the variable of credit card usage and, coded as 1 (one) if the respondent has a credit card and otherwise coded as 0 (zero). X represents

individuals' socio-economic characteristics and demographics classified into five main groups, i.e., age, gender, education, income, and employment. For the gender variable, if the respondent is a female, it is coded as 1; otherwise, 0. The age variable is measured by the age and squared age using several years and squared age. The third variable of education has dummy variables of primary, secondary, and tertiary education. If the individual has completed primary, secondary, or tertiary education, it is coded as 1; otherwise, it is 0. Income is indicated by including dummy variables. Each variable is coded as 1 if the individual's income is in a given quintile of the poorest, second, middle, fourth, and fifth respectively; otherwise, coded as 0. The final variable was employment, and if the respondent is employed, the code was 1, and if not employed, it is coded as 0. The final adjusted dataset was analyzed using the probit regression model in SPSS, which evaluates the marginal effect of variables.

4. Data Analysis

4.1 The descriptive statistical Analysis

In most economies, people use a credit card rather than a debit card to pay bills and make everyday purchases. In high-income economies, 55 percent of adults reported owning a credit card, and in developing economies, credit card ownership remains at a low and unchanged level from 2014. On average, only 10 percent of adults reported having one. The total number of credit cards used in 2017 was 1,435,053, and it is a 13.5 percent increase compared to 2016 (CBSL, 2017). The result indicates that Credit cardholders in the sample are only 7 percent, and in the Sri Lankan context, only 5 percent of the population owns credit cards (Global Findex database, 2017). Table 1 presents the descriptive statistics of the independent variables of age, gender, education, income, and employment, and the dependent variable of credit card demand in Sri Lanka.

Table 1. Descriptive statistics for variables

Variables	Observations	Mean	St. Dev.
Gender (Female)	1080	0.62	0.486
Age	1080	43.84	17.255
Primary- education	1080	0.33	0.469
Secondary- education	1080	0.62	0.486
Tertiary - education	1080	0.05	0.227
Income- Poorest 20%	1080	0.17	0.373
Income- Second 20%	1080	0.18	0.385
Income- Middle 20%	1080	0.19	0.394
Income- Fourth 20%	1080	0.22	0.413
Income- Fifth 20%	1080	0.24	0.429
Employment	1080	0.48	0.500
Use of credit cards	1080	0.07	0.253

As per Table 1, Sri Lanka has a limited number of credit cardholders, representing only 7 percent of the total sample. The mean of having a credit card in Sri Lanka is 7 percent. The other characteristics of the dataset are also described in Table 1.

4.2 Empirical Estimations

Table 2 presents the marginal effects for the probit estimations with credit card usage in Sri Lanka.

Table 2. Probit regression results

Variables	Coefficient value (β)	P-Value (Sig)
Gender (Female)	-.386**	.006
Age	.057**	.037
Age²	-.001**	.016
Primary- education	-1.195***	.000
Secondary- education	-.570**	.005
Income- Poorest 20%	-.455**	.037
Income- Second 20%	-1.199***	.000
Income- Middle 20%	-.471**	.013
Income- Fourth 20%	-.217	.191
Employment	.239*	.100
Other Estimations		
Observations	1080	
LR chi2	92.862	
Prob> chi2 (sig)	0.000	
Log-Likelihood	-192.830	
<i>Significance levels at 10%, 5%, and 1% which indicates *, **, and *** respectively</i>		

The parameters of the model fit measures with the likelihood ratio Chi-Square (LR Chi2) tests of the models are significant as associated with a p-value less than 0.0001 (Hosmer & Lemeshow, 2000) concluded that at least one of the regression coefficients is not equal to zero. As shown in Table 2, the model fit value exists within the model.

Table 2 presents the marginal effects of probit estimations concerning credit card usage in Sri Lanka. The table indicates coefficient values and p values of parameter estimates of age, gender, education, income, and employment. Based on the parameter estimates, the influence of each individual's socio-economic characteristics on the use of credit cards were evaluated.

The results indicate that the female gender has a significant negative relationship with credit card usage, which means that females are less likely to own credit cards. Age is also an explanatory variable positively significant with a credit card and it has a nonlinear relationship. Most study findings revealed that younger people are more likely to have credit cards (Christopher et al., 2016; Wang et al., 2011; Liqiong et al., 2019).

The investigation used three education levels: primary, secondary, and tertiary education. However, the model omitted tertiary education due to the redundancies in the model. The results indicated that primary educated people have a higher negative relationship with credit card usage than secondary educated people. It suggests that higher education people are more likely to have credit cards. Although results are not consistent with the findings from Christopher et al. (2016) and Liqiong et al. (2019), which indicates a positive relationship, the study reveals the negative coefficient will be less when the education level increases.

The model uses the five levels of income quintiles from most mediocre to richest 20 percent, and the wealthiest 20 percent has been omitted from the model due to redundancies. Thus, the model uses the first to fourth income quintiles to determine the influence of income level on the use of credit cards. The estimations show that an individual's income in Sri Lanka relates to credit card usage. Dummy variables were belonging to the first three groups of income of most inferior, and second and middle 20 percent impact the highest negative and significant influence on credit card usage. The fourth income level has an insignificant but less harmful relationship with credit card usage. Thus, it concludes that income has a negative correlation with a decreasing negative coefficient. The findings are consistent with previous findings (Christopher et al., 2016; Liqiong et al., 2019; Baek and Hong, 2004).

The results also disclosed that employment has a positive relationship with credit card usage in Sri Lanka. It revealed that people who have employment are more likely to own a credit card. The findings are in line with Christopher et al. (2016) and Liqiong et al. (2019), which indicates a positive relationship between the credit card and employment.

5. Conclusion

The credit card has become a vital payment tool for consumers across the world. This paper examined the factors influencing the credit card usage in Sri Lanka, based on the World Bank Global index database in 2017. In Sri Lanka, credit card users are only 5 percent of the population. The study reveals several insightful results and also supports previous scholarly findings (Christopher et al., 2016; Liqiong et al., 2019; Baek & Hong, 2004), to some extent. Firstly, it identified that individuals' characteristics affecting credit card usage in Sri Lanka are age, gender, education, income, and employment. The study results do not support previous findings regarding age and credit card demand. In Sri Lanka, Age has a positive relationship with credit card usage, while other scholars revealed that young and the affluent hold credit cards (Worthington et al., 2007).

The findings on education, income, gender, and employment are inconsistent with previous scholars' findings (Christopher et al., 2016; Liqiong et al., 2019; Baek and Hong, 2004), which illustrate the positive relationship with reducing negative coefficient between income and education with credit card usage. The study further showed a positive connection between employment and credit card usage. Accordingly, the findings offer essential managerial suggestions for policymakers.

6. References

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