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## Credit Limit of Unsecured Consumer Lending: Evidence from Micro Data

Suwinto Johan

*Faculty of Business, President University, Indonesia, suwintojohan@gmail.com*

Calista Endrina Dewi

*Institute for Economic and Social Research, Faculty of Economics and Business, Universitas Indonesia (LPEM FEB UI), calistaendrinadewi@gmail.com*

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# Credit Limit of Unsecured Consumer Lending: Evidence from Micro Data

Suwinto Johan<sup>a</sup>, and Calista Endrina Dewi<sup>b,\*</sup>

<sup>a</sup>Faculty of Business, President University, Indonesia

<sup>b</sup>Institute for Economic and Social Research, Faculty of Economics and Business, Universitas Indonesia (LPEM FEB UI)

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## Abstract

As credit card debts have increased in Indonesia over the past ten years, concerns over the impulsive buying behavior of Indonesian credit card holders have emerged. Therefore, more attention must be paid to credit risk management of banks as it plays an important role in analyzing the possibility of losses due to the inability of prospective borrowers to repay debts. This study provides empirical evidence about the prudence of commercial banks in Greater Jakarta in offering credit card limits. Using primary micro-data collected from credit card applications submitted to the largest foreign private bank providing retail credit in the Greater Jakarta area in 2019, this study employed multiple regression model to analyze the determinants of credit card limits in the Greater Jakarta. Our empirical findings suggest that age, home location, income, type of industry, and office location of prospective borrowers significantly influence credit card limits. Commercial banks in the Greater Jakarta, thus, have been prudent in offering credit card limits.

**Keywords:** credit card; credit limit; consumer debt; impulsive buying; credit risk management

**JEL classifications:** G210; G400; O160

## 1. Introduction

Credit cards have become an essential means of payment for consumers around the world (Bernthal, Crockett & Rose 2005). Even though they facilitate consumption and provide convenience for consumers (Warwick & Mansfield 2000), credit cards also have shortcomings. The recent development in financial services has increased the availability and use of credit cards, thereby directly increasing credit card debts (Griffiths 2000). Increased credit card debts may then result in potential negative effects including the possibility of over-committed consumers facing domestic disharmony, the confiscation of assets to repay credit card debts, or even bankruptcy. At the macroeconomic level, high credit card debts may also have economic implications for saving and investment, balance of payments, and economic stability (Plympton & Howe 1989).

Furthermore, concerns over the impulsive buying behavior of credit card holders have also emerged. Easy access to credit cards causes consumers to be less price-conscious (Tokunaga 1993), encouraging consumers to overspend (Pirog & Roberts 2007; Schor 1998; Wang & Xiao 2009) and accelerating the development of impulsive buying behavior (Karbasiyar & Yarahmadi 2011; Roberts & Jones 2001; Rook & Fisher 1995). This is in accordance with previous findings by Deshpandé & Krishnan (1980) and Feinberg (1986), where credit card ownership is associated with purchasing items at a higher price and positively correlated with anticipation and actualization of further credit card use. As a result, credit card holders carry large balances that tend to accumulate because they usually pay only the minimum amount required by the banks (Soman 2001). Credit cards thus lead to greater imprudence of consumers compared to cash. Therefore, more attention must be paid to bank policies regarding credit card limits of prospective borrowers.

\*Corresponding Address: Ali Wardhana Building, UI Salemba Campus, Jl. Salemba 4, DKI Jakarta 10430, Indonesia. Email: calistaendrinadewi@gmail.com.

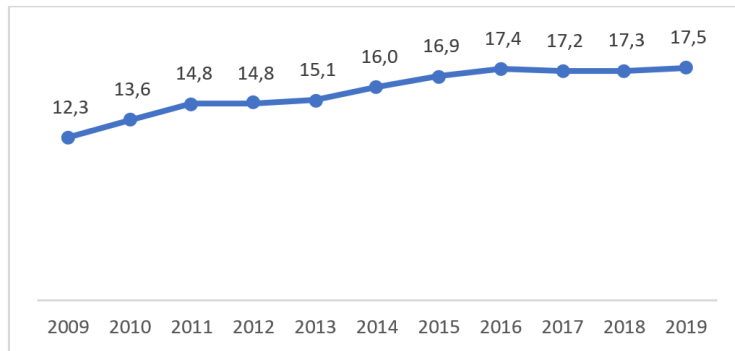
Credit risk management plays an important role in commercial banks as it analyzes the possibility of losses due to the inability of prospective borrowers to repay their debts (Nikolaidou & Vogiazas 2014). Despite the particular attention given since the huge financial losses during global financial crisis, credit risk management remains a challenge for commercial banks to deal with. In the case of credit cards, commercial banks must decide the credit card limits offered to prospective borrowers even though the amount of credit to be issued by the prospective borrowers is uncertain (Dey & Mumy 2009). This uncertainty causes the information regarding the creditworthiness of prospective borrowers incomplete and, eventually, creates mismanagement of credit card limits (Ausubel 1991). Credit card holders who are offered higher credit card limits may turn out to have a lower ability to repay the debts than those who are offered lower credit card limits. Similar mismanagement may exist between credit card holders and non-credit card holders, where credit card holders who borrow a large proportion of their credit card limits may turn out to have a lower ability to repay the debts than non-credit card holders. Nevertheless, credit cards provide a good opportunity for commercial banks to carry out credit expansion. However, the higher the credit expansion, the higher the risk is. Thus, commercial banks must be careful with the tradeoff because credit cards are unsecured.

Existing studies on credit cards mostly focus on analyzing the factors affecting credit card debt behavior. Age, employment status, income, and type of industry have been found to be the determinants of credit card debt behavior (Choi et al. 2020; Gunarathna 2018; Karahan, Mihaljevich & Pilossoph 2017; Herkenhoff, Phillips & Cohen-Cole 2018; Agustino, Sumarwan & Sartono 2018; Arango & Cardona-Sosa 2015). A study by Lin et al. (2019) has also found that credit card debt behavior is also correlated with credit card limits. However, only few studies have specifically investigated the determinants of credit card limits, especially in Indonesia. Dey & Mumy (2009) have found that the proxies for

the quality of prospective borrowers including age, employment status, and income are significantly related to the approved credit card limits. Nevertheless, no studies have considered the office location and home location as well as the type of industry in the analysis of the determinants of credit card limits. Office location and home location are ones of the determinants of the credibility of prospective borrowers (Carroll et al. 2013; Bakshi & Chowdhury 2013; Brown et al. 2010), as well as the type of industry (Herkenhoff, Phillips & Cohen-Cole 2018; Choi et al. 2020; Arango & Cardona-Sosa 2015).

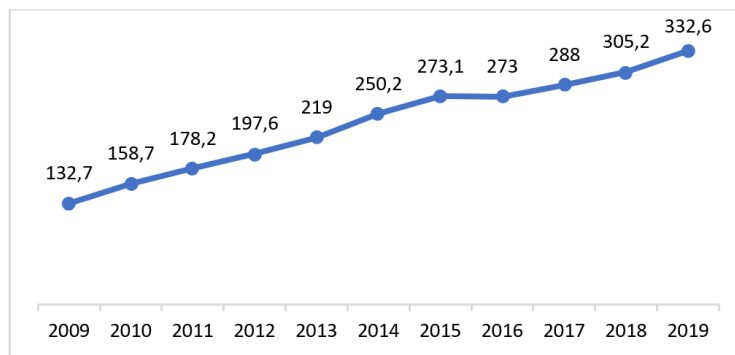
In Indonesia, the number of credit cards in circulation has increased over the past ten years, reaching 17.5 million in 2019 (See Figure 1). Consequently, Indonesia experiences an exponential increase in credit card debts over the past ten years, from IDR132.7 trillion in 2009 to IDR332.6 trillion in 2019 (See Figure 2). This has been exacerbated by the fluctuation of the non-performing loans ratio for commercial banks in Indonesia over the past decade. The non-performing loan ratio of Indonesian commercial banks is reported at 3.2% in November 2020 (CEIC 2021), while the highest ratio is 8.4% in July 2006 and the lowest ratio is 1.8% in December 2013. Regarding these issues, previous studies have shown that the main reason for high credit card debts is the unwise consumer behavior (Tokunaga 1993; Pirog & Roberts 2007; Schor 1998; Wang & Xiao 2009; Karbasivar & Yarahmadi 2011; Roberts & Jones 2001; Rook & Fisher 1995; Soman 2001). However, the contribution of commercial banks to these issues is not widely known. Have commercial banks also been imprudent in offering credit card limits? The answer remains unknown since no studies, particularly in Indonesia, have investigated how commercial banks prudently offer credit card limits.

This study thereby seeks to address the gaps in the literature and provide empirical evidence of the prudence of commercial banks in the Greater Jakarta in offering credit card limits by analyzing the determinants of credit card limits. This study is expected to help the regulators and banks in the Greater Jakarta in determining the factors affecting credit



**Figure 1. The Number of Credit Cards in Circulation in Indonesia, 2009-2019 (in million units)**

Source: Bank Indonesia (2020) and Indonesian Credit Card Association (2020)



**Figure 2. Credit Card Debts in Indonesia, 2009-2019 (in IDR trillion)**

Source: Bank Indonesia (2020) and Indonesian Credit Card Association (2020)

card limits. This study proceeds with literature review explaining the conceptual framework and hypotheses development; research method explaining the estimation strategy and data; discussion of descriptive statistics and estimation results; and formulation of conclusion and recommendations.

## 2. Literature Review

### 2.1. Conceptual Framework

Figure 3 shows the framework of the study. To estimate the creditworthiness of prospective borrowers, creditors use the five principal Cs of credit including character, capacity, capital, collateral, and conditions (Johan 2017; Basu 2019; Disemadi 2019). It considers five characteristics of the prospective borrowers and conditions of the loan to measure the chance of default and, conse-

quently, the risk of financial loss for the creditors. Subsequent to knowing the credit risk of prospective borrowers, creditors then assess the credit card limits that will be offered to the prospective borrowers. This study only focuses on consumer characteristics, financial capacity, and industry condition. Consumer characteristics aim to show the credit history of the consumers. Due to data availability, consumer characteristics are proxied by age, home location, and employment status. Furthermore, financial capital is proxied by annual income rather than debt-to-income ratio because of the availability of data and the fact that annual income is supported by producer data such as salary slips and turnover proofs. Finally, industrial condition is proxied by the type of industry and the location where the consumers work. Capital and collateral are not included in the analysis on the grounds of simplification.

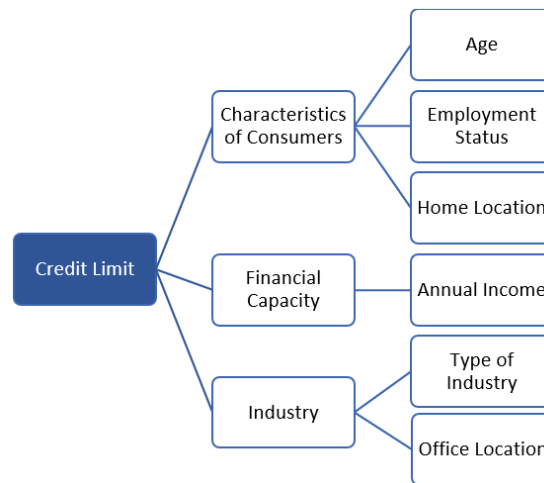


Figure 3. The Conceptual Framework of Factors Considered to Determine Credit Card Limits

## 2.2. Hypotheses Development

This study considers three parameters (age, employment status, and office location) to explain the characteristics of the prospective borrowers, one parameter (income) to explain the financial capacity of the prospective borrowers, and two parameters (type of industry and office location) to explain the industrial condition of the prospective borrower. These parameters are hypothesized to significantly influence credit card limits.

Age is an essential factor affecting credit card limits. Previous studies have reported that age is positively related to credit card limits. The older the prospective borrowers are, the higher the borrowing limit on credit cards is (Dey & Mumy 2009; Choi et al. 2020). However, no studies have investigated the possible inverse U-shape relationship between age and credit card limits. Chen & Chivakul (2008) have suggested that young people are likely to be heavy users of credit cards as their expectation of future income and consumption is higher than their current income. Their income becomes higher with age, making them less likely to borrow because they have enough income to support their demand. Thus, the credit card debts will stop growing and start falling beyond a certain age threshold. Likewise, creditors prefer to offer high credit card

limits to middle-aged people rather than to the young and the old people because middle-aged people usually have more stable income streams and higher net wealth, leading to lower credit risk (Chen & Chivakul 2008). This study applied both linear and quadratic terms of age as independent variables to capture this nonlinear relationship and, therefore, the following are our first and second hypotheses.

*H1. Age is positively related to credit card limits.*

*H2. Age squared is negatively related to credit card limits.*

Even though employment status is found to affect credit card limits of the prospective borrowers, there have been several inconsistencies in the relationship between employment status and credit card limits. Dey & Mummy (2009) have reported that entrepreneurs are most likely to be offered higher credit card limits than employees. This is in line with most studies reporting that entrepreneurs are most likely to be heavy users of credit cards (Joo & Pauwels 2002). In contrast, Karahan, Mihaljevich & Pilossoph (2017), Herkenhoff, Phillips & Cohen-Cole (2018), and Choi et al. (2020) have reported that employees will receive a higher

amount of credit card limits than entrepreneurs will. One possible reason is that employees tend to have positive attitudes towards the use of credit cards and thus tend to have higher credit card debts (Chien & Devaney 2001). Considering these inconsistent results, our third hypothesis is designed to test the relationship between employment status and credit card limits.

*H3. Employment status is related to credit card limits.*

Creditors may also consider home location in determining the credit card limits of the prospective borrowers. Brown et al. (2010), Carroll et al. (2013), and Bakshi & Chowdhury (2013) have suggested that certain locations, such as office and home, of the prospective borrowers can determine their creditworthiness by referring to the purchase history associated with them at those locations. Based on this creditworthiness, creditors can then provide customized credit card offer to prospective borrowers. However, no studies have specifically investigated the relationship between home location and credit card limits. Thus, our fourth hypothesis is designed as follow.

*H4. Home location is related to credit card limits.*

Income is another essential factor, affecting the way people accumulate and manage their debts. Many studies have found that income is positively related to credit card use. Devlin, Worthington & Gerrard (2007) have reported that people with higher income tend to have more credit cards. People with higher income are also more likely to have positive attitudes towards credit card debts and spending (Chien & Devaney 2001; Lin et al. 2019) by dutifully paying off their credit card debts (Balasundram & Ronald 2006). The similar nature is also found in the relationship between income and credit card limits. Dey & Mumy (2009), Agustino, Sumarwan & Sartono (2018), and Gunarathna (2018) have reported that income is positively related to credit card limits. Thus, people with higher income will

receive higher credit card limits, leading to our fifth hypothesis as follow.

*H5. Income is positively related to credit card limits.*

The type of industry where the prospective borrowers work may also influence credit card limits. However, the relationship between type of industry and credit card limits has been reported with inconsistent results. Herkenhoff, Phillips & Cohen-Cole (2018) and Arango & Cardona-Sosa (2015) have reported that prospective borrowers working at financial industry receive a higher amount of credit card limits than those who are not. In contrast, Choi et al. (2020) have reported that prospective borrowers working at financial industry receive lower credit card limits than those who are not. Thus, our sixth hypothesis is designed to test the relationship between the type of industry and credit card limits.

*H6. The type of industry is positively related to credit card limits.*

Finally, creditors may also consider office location in determining credit card limits of the prospective borrowers. Referring to the explanation of our fourth hypothesis, we are also interested in investigating the relationship between office location and credit card limits since no studies have specifically analyzed this. Thus, our last hypothesis is as follows.

*H7. Office location is related to credit card limits.*

## 3. Method

### 3.1. Estimation Strategy

The ordinary least square regression model was then employed to investigate the effects of the parameters of characteristics, financial capacity, and industrial condition of credit card consumers on the

amount of credit card limits they receive, as follows:

$$\begin{aligned} \text{LnCCLimit}_i = & \beta_0 + \beta_1 \text{Age}_i + \beta_1 \text{Age}_i^2 \\ & + \beta_2 \text{JobStatus}_i + \beta_3 \text{OfficeCJ}_i \\ & + \beta_4 \text{OfficeWJ}_i + \beta_5 \text{OfficeEJ}_i \\ & + \beta_6 \text{OfficeNJ}_i + \beta_7 \text{OfficeBG}_i \\ & + \beta_8 \text{OfficeDP}_i + \beta_9 \text{OfficeTG}_i \\ & + \beta_{10} \text{OfficeBK}_i + \beta_{11} \text{HomeCJ}_i \\ & + \beta_{12} \text{HomeWJ}_i + \beta_{13} \text{HomeEJ}_i \\ & + \beta_{14} \text{HomeSJ}_i + \beta_{15} \text{HomeNJ}_i \\ & + \beta_{16} \text{OfficeBG}_i + \beta_{17} \text{OfficeDP}_i \\ & + \beta_{18} \text{OfficeTG}_i \\ & + \beta_{19} \text{LnAnnualIncome}_i \\ & + \beta_{20} \text{Industry}_i + e_i \end{aligned} \quad (1)$$

It means that credit card limits are a function of the characteristics of credit card consumers (age, employment status dummy, and home location dummies), financial capacity (annual income), and industrial condition (type of industry dummy and office location dummies). In order to deal with concerns about failure to meet assumptions, such as minor problems about normality and heteroscedasticity, we used robust option in estimating the standard errors. Our dependent variable, namely credit card limits, will be in the form of a natural logarithmic. The description of the variables is shown in Table 1.

### 3.2. Data

This study used primary micro-data collected from credit card applications submitted to the largest foreign private bank providing retail credit in the Greater Jakarta in 2019<sup>1</sup>. In this study, the determinants of credit card limits are investigated in the Greater Jakarta where the minimum income of

<sup>1</sup>The data used in this study is confidential. It does not disclose consumer personal information such as full name and address and has strict terms and conditions regarding the use and dissemination of the results to ensure the privacy of the credit card consumers and the bank involved in this study. We are also prohibited from presenting results that allow the identification of the bank from which the data was collected.

credit card consumers is IDR12,000,000 with an appropriate historical payment based on OJK SLIK (Financial Information Services System of Indonesian Financial Service Authority). Thus, the unit of analysis in this study is credit card consumers of the largest foreign private bank providing retail credit in the Greater Jakarta.

## 4. Result

### 4.1. Descriptive Statistics

Table 2 presents descriptive statistics of the credit card limits of 1,757 credit card consumers in the Greater Jakarta. Credit card limits vary across groups of different consumer characteristics (age, employment status, and home location), gross annual income quintiles, type of industry, and office location.

Observing the age group, Table 2 shows that the older the consumers are, the higher the average credit card limits are. Furthermore, self-employed consumers have higher credit card limits than consumers who are employees. The results of statistical test show that the difference in the average credit card limits between age groups and between self-employed consumers and employees is statistically significant. According to home location, consumers whose homes are located in West Jakarta have the highest credit card limits while consumers whose homes are located in Depok have the lowest credit card limits. However, the results of statistical test show that there is no significant difference in the average credit card limits between home locations.

Based on the gross annual income quintiles, the average credit card limits are greater for higher-income consumers compared to lower-income consumers. The results of statistical test show that there is a significant difference in the average credit card limits between gross annual income quintiles. According to the type of industry, the average credit card limits are greater for consumers working in financial industry compared to consumers working

**Table 1. Variable Description**

Variables	Description	Expected Sign
<b>Consumer Characteristic</b>		
Age	Consumer's age	+
Age squared	Consumer's age squared	-
Employment Status	Consumer's employment status dummy, 1 = entrepreneurs and 0 = employees	-
<b>Home Location</b>		
Consumer's home location dummies		
Central Jakarta	1 = Yes and 0 = No	+/-
West Jakarta	1 = Yes and 0 = No	+/-
South Jakarta	1 = Yes and 0 = No	+/-
East Jakarta	1 = Yes and 0 = No	+/-
North Jakarta	1 = Yes and 0 = No	+/-
Bogor	1 = Yes and 0 = No	+/-
Depok	1 = Yes and 0 = No	+/-
Tangerang	1 = Yes and 0 = No	+/-
<b>Financial Capacity</b>		
Ln of Annual Income	Consumer's gross annual income in the form of a natural logarithmic	+
<b>Industrial Condition</b>		
Type of industry		
Type of consumer's industry dummy, where 1 = financial industry and 0 = non-financial industry		+
<b>Office Location</b>		
Consumer's office location dummies		
Central Jakarta	1 = Yes and 0 = No	+/-
West Jakarta	1 = Yes and 0 = No	+/-
East Jakarta	1 = Yes and 0 = No	+/-
North Jakarta	1 = Yes and 0 = No	+/-
Bogor	1 = Yes and 0 = No	+/-
Depok	1 = Yes and 0 = No	+/-
Tangerang	1 = Yes and 0 = No	+/-
Bekasi	1 = Yes and 0 = No	+/-

in non-financial industry. Finally, the average credit card limits are the highest for consumers whose offices are located in North Jakarta and lowest for consumers whose offices are located in Bekasi. However, the results of statistical test show that the difference in the average credit card limits between types of industry and between office locations are not statistically significant.

## 4.2. Estimation Results

Table 3 shows the estimation results of the ordinary least square regression model with a Prob > F = 0.000 and an adj. R-squared of 0.2510. Age, office location dummies (Central Jakarta, East Jakarta, and Tangerang), home location dummies (West Jakarta, North Jakarta, Bogor, and Tangerang), gross annual income, and financial industry dummy are significant in explaining credit card limits.

First, age is significant in determining credit card limits with the coefficient of age is positive. People

are more likely to receive higher amount of credit card limits as they get older. We found that credit card limits tend to increase by 4.1% as the consumers get older by one year. The result is also consistent with previous studies conducted by Dey & Mumy (2009) and Choi et al. (2020), finding that the older the age of the consumers, the higher the credit card limits offered by the bank. However, the negative coefficient of age squared is not significant in determining credit card limits. An inverted U-shaped relationship between age and credit card limits thus is not found. This contradicts the fact that there is a certain age threshold beyond which the credit card debts will stop growing and start falling (Chen & Chivakul 2008). It stimulates creditors to offer high credit card limits to people in their highly compensated middle age than to people in early and late stage of life as people in their highly compensated middle age usually have more stable income streams and higher net wealth, leading to lower credit risk (Chen & Chivakul 2008). Thus, our first hypothesis is supported, while our second



**Table 2. The Descriptive Statistics of Credit Card Limits**

Credit Card Limits	Mean	SD	Min	Max	Statistical Test
Age					F = 21.06***
22–31 years old	24,900,000	19,600,000	2,000,000	200,000,000	
32–41 years old	36,800,000	38,800,000	8,000,000	350,000,000	
42–51 years old	45,100,000	41,700,000	1,800,000	300,000,000	
>51 years old	57,500,000	72,500,000	12,000,000	600,000,000	
Employment Status					t = -7.79***
Self-Employed	53,300,000	51,700,000	12,000,000	300,000,000	
Employee	33,400,000	35,400,000	1,800,000	600,000,000	
Home Location					F = 1.86***
Central Jakarta	34,200,000	29,600,000	12,000,000	200,000,000	
West Jakarta	40,500,000	43,600,000	12,000,000	300,000,000	
South Jakarta	38,800,000	44,500,000	1,800,000	600,000,000	
East Jakarta	31,800,000	31,800,000	8,000,000	200,000,000	
North Jakarta	37,700,000	41,900,000	2,000,000	350,000,000	
Bogor	31,900,000	23,700,000	12,000,000	120,000,000	
Depok	26,300,000	14,100,000	10,000,000	50,000,000	
Tangerang	35,400,000	40,800,000	12,000,000	344,000,000	
Bekasi	35,300,000	34,500,000	12,000,000	227,000,000	
Gross Annual Income					F=94.01***
Quintile 1	21,100,000	14,800,000	1,800,000	125,000,000	
Quintile 2	25,900,000	22,200,000	12,000,000	200,000,000	
Quintile 3	30,100,000	24,200,000	2,000,000	151,000,000	
Quintile 4	38,300,000	29,500,000	12,000,000	227,000,000	
Quintile 5	67,400,000	64,300,000	12,000,000	600,000,000	
Type of Industry					t = -0.11
Financial	36,700,000	33,900,000	8,000,000	202,000,000	
Non-Financial	36,400,000	39,900,000	1,800,000	600,000,000	
Office Location					F = 1.19
Central Jakarta	35,900,000	28,800,000	8,000,000	130,000,000	
West Jakarta	40,400,000	39,700,000	2,000,000	300,000,000	
South Jakarta	37,700,000	39,400,000	12,000,000	225,000,000	
East Jakarta	36,100,000	50,500,000	12,000,000	600,000,000	
North Jakarta	43,400,000	44,700,000	12,000,000	300,000,000	
Bogor	33,800,000	25,900,000	12,000,000	132,000,000	
Depok	33,900,000	26,700,000	12,000,000	164,000,000	
Tangerang	37,700,000	43,800,000	1,800,000	350,000,000	
Bekasi	30,400,000	27,700,000	10,000,000	227,000,000	
Observations	1,757	1,757	1,757	1,757	

Source: Authors' calculation

Note: \*p&lt;0.05, \*\*p&lt;0.01, \*\*\*p&lt;0.001

hypothesis is not supported by the result.

Second, employment status dummy is insignificant in determining credit card limits. The insignificant coefficient indicates that there is no significant difference in credit card limits between self-employed people and people working as employees. The result does not support our third hypothesis. It is inconsistent with conventional credit underwriting policies such a way that those with a stable employment history and high job security are offered a higher amount of credit card limits than those with temporary jobs, where most banks appear to project the ability of prospective borrowers to pay

debts on human capital factors such as employment status (Karahana, Mihaljevich & Pilossoph 2017; Herkenhoff, Phillips & Cohen-Cole 2018; Choi et al. 2020).

The coefficients of home location dummies are all positive, but only the coefficients of West Jakarta, North Jakarta, and Tangerang are significant. Those whose homes are located in West Jakarta, North Jakarta, and Tangerang tend to receive a higher amount of credit card limits relative to those whose homes are located in Bekasi. West Jakarta has the largest and significant impact in increasing credit card limits. With reference to those

**Table 3. Estimation Results**

Log of Credit Card Limits	Coefficients	Standard Errors
Age	0.0414*	(2.40)
Age squared	-0.0003	(-1.47)
Self-employed	0.0120	(0.26)
Home Location		
Central Jakarta	0.1630	(1.82)
West Jakarta	0.2200***	(3.53)
South Jakarta	0.1020	(1.68)
East Jakarta	0.1040	(1.73)
North Jakarta	0.1800*	(2.45)
Bogor	0.1430	(1.95)
Depok	0.1110	(1.52)
Tangerang	0.1570**	(2.77)
Log of Gross Annual Income	0.4200***	(17.95)
Financial	0.0821*	(2.05)
Office Location		
Central Jakarta	-0.0923*	(-2.04)
West Jakarta	-0.0508	(-0.92)
East Jakarta	-0.1560*	(-2.34)
North Jakarta	-0.0360	(-0.59)
Bogor	-0.1780	(-1.84)
Depok	-0.1540	(-1.31)
Tangerang	-0.1440**	(-2.68)
Bekasi	0.0184	(0.29)
Constant	7.7960***	(14.54)
N	1,757	
Prob > F	0.0000	
Adj. R-squared	0.2510	

Source: Authors' calculation

Note: t statistics in parentheses, \*p&lt;0.05, \*\*p&lt;0.01, \*\*\*p&lt;0.001

living in Bekasi, those living in West Jakarta, North Jakarta, and Tangerang are offered 22%, 18%, and 15.7% higher credit card limits, respectively. The result corresponds to Bekasi, as our bottom base for home location dummies, being the most populous city compared to others with notable trade, business, and processing industries. Moreover, the result is also in line with previous descriptive statistics, where credit card consumers whose homes are located in Bekasi receive lower average credit card limits than credit card consumers whose homes are located in West Jakarta, North Jakarta, and Tangerang (See Table 2). The result supports our fourth hypothesis and is echoed by several studies suggesting home location as one of the determinants of the credibility of prospective borrowers (Carroll et al. 2013; Bakshi & Chowdhury 2013; Brown et al. 2010).

Furthermore, gross annual income is positively and significantly correlated with credit card limits, meaning that higher credit card limits is offered

to those with higher gross annual income. A percent increase in gross income explains the 42% increase in credit card limits. Most studies agree that those with higher income are more likely to have higher credit card limits (Dey & Mumy 2009; Agustino, Sumarwan & Sartono 2018; Gunarathna 2018). Previous studies by Albanesi, De Giorgi & Nosal (2017), Beer, Ionescu & Li (2018), and Choi et al. (2020) have also suggested that income is the most important factor for banks in determining credit card limits on the grounds that it can show the ability of prospective borrowers to pay debts. The higher the income, the higher the ability of prospective borrowers can pay debts. The result supports our fifth hypothesis and is also consistent with the fact that credit cards represent a lifestyle and convenience for those who earn more and, thus, are considered as "luxury" for those who earn less (Lee & Kwon 2002; Bernthal, Crockett & Rose 2005).

The coefficient of financial industry dummy is positive and significant. Among the types of industry, those who work in the financial industry have the most significant effect on the increase in credit card limits. Those who work in the financial industry tend to receive 8.2% higher credit card limits than those who work in the non-financial industry. This is due to the tendency for people who work in the financial industry to have better understanding of financial knowledge than those who do not, as Allgood & Walstad (2011) have also found that having actual and perceived financial knowledge significantly influence credit card behavior. The result supports our sixth hypothesis and is also in line with previous studies by Herkenhoff, Phillips & Cohen-Cole (2018) and Arango & Cardona-Sosa (2015).

Finally, except for Bekasi, the coefficients of office location dummies are all negative. However, only the coefficients of Central Jakarta, East Jakarta, and Tangerang are significant. Those with offices in Central Jakarta, East Jakarta, and Tangerang tend to receive lower credit card limits than those with offices in South Jakarta. East Jakarta has the largest and significant impact in decreasing credit card limits. With reference to those who work in South

Jakarta, those who work in Central Jakarta, East Jakarta, and Tangerang are offered 9.2%, 15.6%, 14.4% lower credit card limits, respectively. The result corresponds to South Jakarta, as our top base for office location dummies, being the most prosperous administrative city compared to others with major business centers including Sudirman Central Business District (SCBD), Mega Kuningan, and M.T. Haryono Street. In addition, the result is also in line with previous descriptive statistics, where credit card consumers with offices in South Jakarta receive higher average credit card limits than credit card consumers with offices in Central Jakarta, East Jakarta, and Tangerang (See Table 2). The result supports our fourth hypothesis and is echoed by several studies suggesting office location as one of the determinants of the credibility of prospective borrowers (Carroll et al. 2013; Bakshi & Chowdhury 2013; Brown et al. 2010).

## 5. Conclusion

Credit card use has grown rapidly in Indonesia because it facilitates consumption and provides convenience for consumers. At the same time, concerns over the impulsive buying behavior of credit card holders have also emerged. Consequently, Indonesia has experienced an exponential increase in credit card debts over the past ten years. This study provides empirical evidence about the prudence of commercial banks in the Greater Jakarta in offering credit card limits. Using primary micro-data collected from credit card applications submitted to the largest foreign private bank providing retail credit in the Greater Jakarta in 2019, this study employed multiple regression model to analyze the determinants of credit card limits in the Greater Jakarta.

Our empirical findings suggest that the characteristics, financial capacity, and industrial condition of prospective borrowers are important in explaining variations in credit card limits. This study found that credit card limits tend to increase by 4.1% as the consumers get older by one year. Regarding office

and home locations, this study also found that those with offices in Central Jakarta, East Jakarta, and Tangerang are offered 9.2%, 15.6%, and 14.4% lower credit card limits, respectively, than those with offices in South Jakarta. Meanwhile, those whose homes are located in West Jakarta, North Jakarta, and Tangerang are offered 22%, 18%, and 15.7% higher credit card limits, respectively, than those whose homes are located in Bekasi. As one of the important determinants, gross annual income is positively and significantly correlated with credit card limits, where a percent increase in gross income explains the 42% increase in credit card limits. Moreover, based on type of industry, those who work in the financial industry tend to receive 8.2% higher credit card limits than those who work in the non-financial industry.

Thus, the policy implication of this study is that commercial banks in the Greater Jakarta have been prudent in offering credit card limits as they have taken into account the factors of age, office location, home location, gross annual income, and type of industry of prospective borrowers in their management policies on credit card limits. That means that the high credit card debts in Indonesia over the past ten years may have occurred due to the unwise and careless behavior of credit card holders, including excessive credit card use, rather than the imprudence of commercial banks. However, according to our empirical findings, commercial banks have not paid much attention to employment status and the possible inverse U-shape relationship between age and credit card limits in determining credit card limits. Therefore, the Indonesian government is suggested to consider monitoring the management policies on credit card limits of commercial banks. This aims to minimize the possibility of mismanagement of credit card limits by commercial banks in the future. Finally, this study can contribute to the literature by providing much needed empirical findings on the determinants of credit card limits. The information provided in this study is important given that no comparable studies have been presented the information, particularly in Indonesia. Moreover,

this study also provides empirical data on the actual credit card limits offered in one of commercial banks in the Greater Jakarta.

However, this study is subject to several limitations. First, this study only considered the available variables in determining credit card limits, however, other variables such as marital status, length of work, and the history of credit card use that have been found to affect credit card debt behavior may also be important in determining credit card limits. Second, the data used only covered credit card consumers of one commercial bank in the Greater Jakarta, so it cannot represent all credit card consumers in the Greater Jakarta. Third, the method used did not consider the first-stage impact of factors on credit risk, but only considered the direct impact of factors on credit card limits. Further research by including other related variables, adding more samples, and using more complex method is recommended to improve the validity of the results of this study. Issues regarding the possible relationship between employment status and credit card limits as well as the possible U-inverse relationship between age and credit card limits that commercial banks in the Greater Jakarta have not paid much attention to are also interesting and important for future research.

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