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12 May 2011

A Profile of Financially at-Risk College Students from an Emerging Market

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Abstract

College students frequently show they have little skill when it comes to using a credit card in a rational manner. This article deals with this issue in a relevant emerging market and in a pioneering manner. University students (n = 769), in São Paulo/Brazil, replied to a questionnaire about their credit card use habits. Using Logit models it was seen that there exist associations between personal characteristics and credit card use habits that involve financially risky behavior. The two main results were: i) larger number of credit cards increase the probability of risky behavior; ii) those students who alleged they knew what interest rates the card administrators were charging were less inclined to engage in risky behavior. Although conscious of the fact that the results are based on data collected in a single city, which might constitute a limitation of this article, it has to be emphasized that this is Brazil's main financial center. The results are of interest to the financial industry, to university managers and to public policy makers. The results point to the advisability, indeed necessity, of providing students with information about the use of financial products (notably credit cards) bearing in mind the high interest rates which their users are charged. The findings regarding student behavior in the use of credit cards in emerging economies are both significant and relevant. Furthermore, financial literature, at the same time that it states the importance of the topic, has not significantly examined emerging economies, a group of promising markets.

Keywords: Credit cards, Young Adults, Consumers, Emerging Market, Personal Finance.
JEL Code: D12; D14; D81; G21

1. Introduction

University students frequently find themselves at a time in their lives when they have growing responsibilities and when they are obliged to take decisions that will define their financial independence and that have consequences for their future well-being and security. Decision-making methods and the financial habits of citizens, especially university students, have received considerable attention from both government and the financial industry. However, with the exception of the United States, what is seen is that this issue is being studied in less depth in the academic environment in the finance community, notably when emerging markets like Brazil are considered.

The main role of financial innovation is to promote the well-being of society through a reduction in the cost of capital, promoting greater efficiency and facilitating the control of consumption and investment decisions, with considerable benefits for borrowers and investors alike, i.e. families, corporations and governments (Sánchez, 2010, p. 27). Therefore, it becomes imperative to carry out studies that seek to throw light on this topic, bearing in mind just how relevant a better understanding of the credit-related behavior of future citizens is. The objective of this research, therefore, is to check for the existence of associations between the profile of university students in São Paulo, Brazil's main financial center, and the occurrence of behaviors considered 'risky' when it comes to the use of credit cards. In this context, the relevance of the role of the university is clear to see. This is an environment that is, of necessity, well-placed for educating students because of the influence it exercises over their behavior.

In terms of citizen access to credit there is little doubt that currently this has a strong influence on the lifestyle of people, providing them with convenience, social status and purchasing power. However, the indiscriminate use of credit cards can have a considerably harmful effect on well-being (Bernthal, Crockett & Rose, 2005). The negative reflections of the inconsequential financial behavior of young adults may constitute a great difficulty in their academic performance, in addition to compromising their physical and mental health (Lyons, 2004 and 2007).

According to research in economic psychology high levels of financial stress are often associated with increased levels of psychological and physical stress (MacFadyen, MacFadyen & Prince, 1996; Lyons & Yilmazer, 2005). Along this same line of thinking, studies have documented the high levels of indebtedness of students, who sometimes seek to finance their studies, whether by paying college fees or even buying college material, with funds coming from their credit card (Nellie Mae, 2005). The net result of this is a panorama of high indebtedness, which in some cases even leads students to committing suicide. In the United States government and school managers have introduced restrictions on requests for credit cards on college campuses (Norvilitis & Santa Maria, 2002).

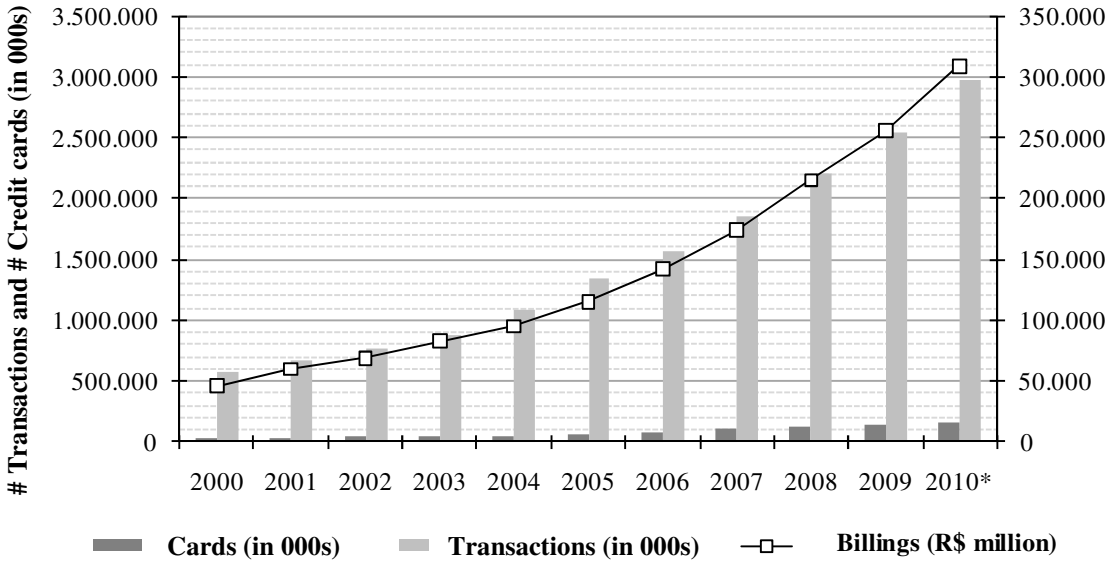
The main contribution of this study to the finance field is to offer, in a pioneering way, empirical evidence of associations between the profile of university students and the occurrence of risk behavior in the use of credit cards in an emerging market. From the 769 valid responses collected in São Paulo/Brazil, using Logit models, the main results are: i) using a larger number of credit cards can significantly increase the probability of risky behavior on the part of students in the use of this financial instrument; ii) those students who alleged they knew the interests rates charged by the card administrators were less likely to indulge in risky behavior. This suggests that financial education may contribute to positive behavior when using a credit card. These findings

are essentially of interest to public policy makers (Mansfield & Pinto, 2007), the financial industry (Fogel & Schneider, 2011), and school managers (Lyons, 2007).

This paper is organized into five sections, including this introduction. In Section 2 the theoretical and empirical bases that support this research are presented. In Section 3 the methodological procedures used are detailed. Then in Section 4, the empirical results are discussed. Finally in Section 5 the final considerations are presented.

2. Background

Over the last two decades there has been an increase in the use of credit cards by university students (Nellie Mae, 2005; U.S. General Accountability Office, 2001; Manning, 2000), making it necessary to understand better the behavior of this particular public. Since the last decade the volume of credit in the Brazilian economy has grown strongly. According to studies within the financial industry in the Brazilian National Finance System, between January 2004 and January 2011 the bank lending/Gross Domestic Product ratio went from 24.3% to 46.5%. At the same time, the volume of credit went from ~R$417.8 billion to ~R$1.71trillion, essentially due to growth in the personal credit portfolio, which represented ~38% of all lending. At the end of this same period, it reached ~46% of the credit stock, at ~R$787.1 billion (Depec, 2011). When this is associated with the growth in the credit card market (see Graph 1) it becomes possible to arrive at a reasonable estimate for the size of the card industry.



Graph 1: Evolution of credit card use statistics in Brazil

Source: Based on data from the Brazilian Association of Credit Card and Service Companies (2011). **Notes**: This graphs shows the evolution of three measures relating to credit card use in Brazil: # Credit cards (in 000s); # Transactions (in 000s); billings (in R$ million). Between 2000 and 2009 (*the numbers for 2010, as at the latest version of this paper, were still estimates) there was strong growth in the credit card market in Brazil. Throughout this period, therefore, for the: # Credit cards: Δ% = 379%; # Transactions: Δ% = 346%; and billings: Δ% = 460%.

The line of work that is supported by the traditional Life Cycle Theory with budgetary restrictions, as proposed by Modigliani (1998), provides provocative insights into the financial decisions taken by citizens, including the inter-generational transfer of financial behavior, i.e. the reasons why students get into debt (Lyons, Scherpf and Neelakantan, 2007). The conceptual model of this research assumes that financial behavior has an impact on the well-being of individuals within the personal finance area and that this has repercussions on their mental and physical health, academic performance and satisfaction with life (Xiao, Noring & Anderson, 1995; Kahneman *et al*., 2006).

Studies relating to behavior with credit cards usually combine knowledge from different fields, e.g.: economics, sociology and psychology, following a connected domain approach, which is also looked for in this study. Two approaches can be found in these works. One line focuses on social and economic psychology, which explores student attitudes, perceptions and behavior vis-à-vis credit cards and money in general (Hayhoe, 2002; Roberts & Jones, 2001; Kidwell & Turrisi, 2000; Danes & Hira, 1987; Fan & Xiao,1998; Markovich & Devaney, 1997; Masuo, Malroutu, Hanashiro & Kim, 2004; Rindfleisch, Burroughs & Denton, 1997).

The other line of work, which deals more specifically with student behavior with regard to credit cards, uses concepts of applied economics for documenting patterns of association between demographic aspects and habits in the use of credit cards (Allen & Jover, 1997; Lawrence, *et al*., 2006; Xiao, Noring & Anderson, 1995; Joo, Grable & Bagwell, 2003; U.S. General Accountability Office, 2001; Hayhoe, 2002; Lyons, 2004 e 2007). This work follows the latter line of thinking.

In Brazilian literature no significant attention has yet been paid to the theme of consumer behavior relative to credit card services. As far as we know there is just one piece of research in this area, which was carried out by Veludo-de-Oliveira, Ikeda & Santos (2004), who concentrate on exploring personal characteristics. There are other studies that support a structured analysis of the formation of financial behavior and how this behavior extends to impact on the well-being of young adults, as presented in Table 1.

Author	Objective	Method	Key Results
Fogel & Schneider (2011)	To check associations between the student's profile and risk behavior with money.	Application of ANOVA and ANCOVA from a survey of 301 students in New York.	The bigger the income the greater the compulsive buying and money worries.
Veludo-de-Oliveira, Ikeda & Santos (2004)	T o investigate the influence of credit cards on compulsive buying behavior.	Exploratory study (they used the likert scale) with 188 young adults in São Paulo/Brazil.	Young adults with a propensity for compulsiveness use credit cards more intensely.
Masuo *et al*. (2004)	To analyze the beliefs and behavior of students with regard to money.	Factor analysis with 290 Asian and North American university students, exploring intercultural constructs.	They found three factors: Power, security and finances. Asians strongly believe that money brings power and security.
Pinto, Parente & Palmer (2001)	To check if the academic performance of students is in any way associated with their behavior when using credit cards	Survey with 260 students (classified into groups with high and low academic performance) from 3 universities in the United States.	They found no association between academic performance and behavior in the use of credit cards.
Hayhoe, Leach, Turner, Bruin & Lawrence (2000)	To check feelings about the credit cards that students use.	OLS regression. N= 480, with students in the United States.	Women tend to spend more on clothes, while men buy more electronic goods. The gender variable has more influence on the forecast of financial management practices than on the actual attitude to credit.
Hayhoe, Leach & Turner, (1999)	To check the reasons for using credit cards.	Logit regression and OLS, with 480 students in the United States.	The significant predictors were: actual attitude to credit, age, the cognitive attitude to credit and gender.
Fan & Xiao (1998)	To study the profile of young adult Chinese as to the way they take buying decisions.	Comparative study using Factor Analysis, taken from 271 questionnaires applied in 5 Chinese universities.	There was found to be a similarity in dimension and profile between the decision-making process of Chinese students and the results obtained with students in the United States and South Korea.
Rindfleisch, Burroughs & Denton (1997)	To analyze associations between family structure and attitude with regard to consumption.	Analysis by MANOVA, with 138 questionnaires.	Family structure is related both to materialism and compulsive consumption.
Danes & Hira (1987)	To describe student knowledge of financial administration, explaining their skill differences as a function of this knowledge.	Pearson correlation and least squares correlation, from data collected from 323 respondents.	On average, students need greater financial knowledge. Their knowledge about insurance, credit and other areas of finance was superficial.

Table 1: Summary of the main empirical works on the credit behavior of university students

3. Method

3.1 Data collection and variables

The questionnaire adapted from Lyons (2004 and 2007), which made it possible to obtain the variables used in this research, is divided into three parts: i) Use and knowledge of aspects relating to credit; ii) Financial education; and iii) Social profile. Data were collected in February and March 2011 from university students from different higher education institutions in São Paulo (Brazil's main financial center), who were randomly approached on university campuses.

As assumed by Lyons (2004), students who took place in the survey were classified as being financially risky when at least one of the following four characteristics was found; these constituted the dependent variables (dummy, with a value = 1 when risk behavior was found, and zero if not): i) the debit balance on the credit card is equal to or more than R$ 1000; ii) delay in paying the bill of 60 days or more; iii) uses the full limit of the credit card; iv) pays the full amount of the statement sporadically or never does. Based on these four a fifth dependent variable was obtained: v) displays at least one of these four behaviors.

As independent variables (dummy) 22 factors are used (listed in Table 1), organized into three groups, namely: i) Demographic aspects; ii) Financial behavior; iii) Types of credit card use. It is worth pointing out that some factors may be endogenous. However, due to limitations in the data it was not possible to obtain instruments for controlling for the possibility of endogeneity. So, it is assumed that these values can be exogenously determined. The error term, u_i, is assumed as being normally distributed, with a mean of zero and a variance equal to 1.

3.2 The empirical model

Binary response non-linear regression models are used in this research. The two most widely used approaches in financial literature for this purpose are the *Logit* and *Probit* models, with the first being widely used for convenience (mathematical), bearing in mind the practicality for interpreting the estimated parameters (Dietrich & Sorensen, 1984; Aldrich & Nelson, 1984).

The estimated parameters in the regressions may be assumed from the descriptive (to the extent that they try to describe the nature of associations between the mean response, i.e. the probability of a student having a high debit balance, for example, with the 22 regressor variables), and predictive (i.e.: to estimate if a student will assume risk behavior, given his demographic profile and his credit card use habits) points of view. The logistic function (for the case of a single predictor variable) is given by the expression (3.1), as follows:

$$E(Y_i|X_i) = \pi_i = \frac{exp(\beta_0 + \beta_1 X_i)}{1 + exp(\beta_0 + \beta_1 X_i)} \therefore \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_i)}} \quad (3.1)$$

which is equivalent to (3.2):

$$E(Y_i|X_i) = \pi_i = [1 + exp(-\beta_0 - \beta_1 X_i)]^{-1} \quad (3.2)$$

However, in the case of a binary response regression model, comprising *k* regressors, we have (3.3):

$$E(Y_i|X_i) = \pi_i = [1 + exp(-\boldsymbol{\beta}'\boldsymbol{X})]^{-1} \quad (3.3)$$

with:

$$\boldsymbol{\beta}'\boldsymbol{X} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k \qquad (3.4)$$

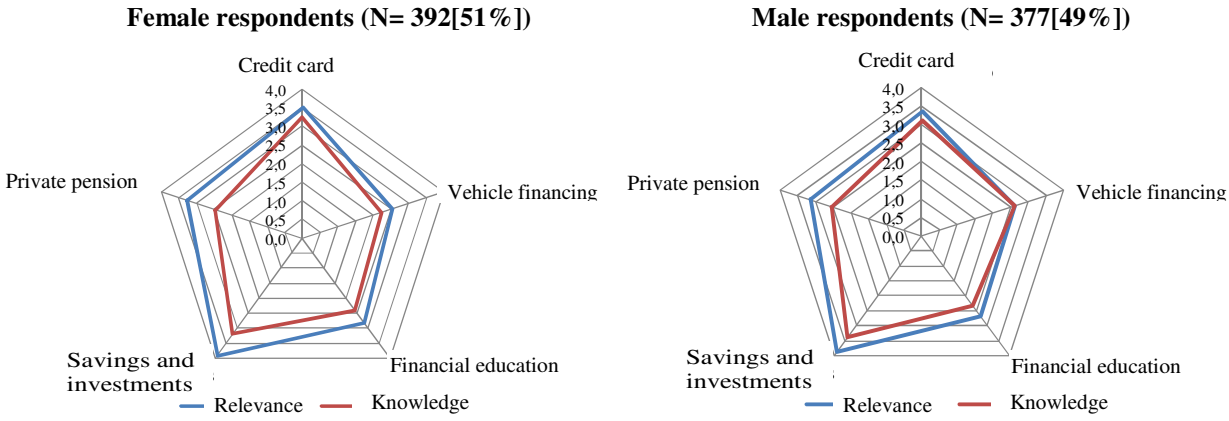
4. Results

4.1 Exploratory analysis of the data

Examining Graph 2, it can be seen that the whole group (N = 769) of respondents (whether they have a credit card or not), both male and female, attributed great relevance to issues relating to: i) investments, ii) credit cards, and iii) private pension schemes. In addition, there is a lot of scope for training citizens in the savings, investments and private pension areas, notably when the group of female respondents is looked at.

With respect to the relevance and level of alleged knowledge of financial products on the part of the participating students, Graph 2 shows the picture for both male and female individuals. The Mann-Whitney U Test revealed an independence between *gender* and the relevance attributed by the respondents. In the case of financial product knowledge independence was also observed between these variables, with the exception of Financing Vehicles and Savings and Investments ($p < 0.01$; N = 769). This suggests that male individuals, to a significant extent, tended to allege they had great knowledge of these two financial products.

Of the 552 students who had credit cards 194 were classified as having at least one risk behavior, representing approximately 35.1%. In this sense, 136 (~70.1%) of the 194 people identified as 'at risk' were classified in just one of the four possible behaviors; thirty-eight students were classified in two risk behaviors simultaneously; sixteen students had three behaviors and only five of the 194 students alleged they had four risk behaviors.



Graph 2: Perception of the relevance and knowledge of financial products (as judged by the respondent students)

Note: The graph on the left represents the average values for the relevance and knowledge (self-declared) of financial products on the part of female respondents and on the right are the responses from male students. The points scale considers 1 (no relevance/knowledge) to 5 (a lot of relevance/knowledge).

Also in Table 1 it can be seen that most of the respondents are female (~51%). They are also in the majority when the gender of the 552 students who have credit cards is observed (~52.5%). However, male students are in the majority (54.6%, compared with 45.0% found by Lyons (2004) in the North American

market) among students in the group of individuals who use credit cards and display one or more of the risk behaviors considered in this research.

4.2 Logit regression analysis

The quality of the results obtained was analyzed, based on four measures: i) R^2 of MacFadden (Aldrich & Nelson, 1984); ii) percentage of events classified correctly; iii) Verisimilitude ratio; iv) Homoscedastic error term test, u_i, of the regression. The first two measures are used to illustrate the adjustment level of the estimated model and the third indicates whether the explanatory variables jointly do not have an effect on the dependent variable. The last measure is a diagnosis to check if the results obtained are valid.

Table 2 and Table 3 show the results obtained in the simulations. In the upper part are the estimated coefficients for the explanatory models of the dependent variables ($y = 1$): i) having a negative balance equal to or greater than R$1000; ii) failing to pay the bill punctually for at least two months; iii) not paying off the credit card bill in full; iv) having at least one of the risk behaviors observed. The results obtained in the simulation of the explanatory model of one of the five dependent variables studied were suppressed, bearing in mind that their results were judged to be inconsistent in the light of the measures adopted for diagnosing the quality of the models. The first column of Table 2 and Table 3 gives the 22 independent variables. To the right of each one of them is the respective estimated β_i parameter, the standard error and the significance, which suggests the marginal effect on the conditional probability of the dependent variable.

With regard to the arguments defended by researchers like Joo, Grable & Bagwell (2001), who assume that maintaining significant debit balances constitutes risk behavior on the part of students in their dealings with credit cards, in Table 2 it can be seen that there are substantial signs that students who have more than 3 credit cards ($\beta_1 \cong 1.5156$; $p < 0.01$) tend to be more likely to have debit balances over R$1000. This result also supports the theory of Black (2001), for whom individuals who have a large numbers of credit cards tend to adopt compulsive behaviors in their purchases, acquiring goods and services that are of little use (Roberts & Jones, 2001).

Therefore, these individuals act in such a way as to seek to reduce their high levels of anxiety, or even to try and acquire social status, acceptance and recognition in their social group by means of consumption that is not very rational (John, 1999). In addition, students who are in a relationship seem to have a greater propensity for assuming large debit balances ($\beta_{16} \cong 1.0770$; $p < 0.1$). The estimated model for the probability of maintaining a debit balance equal to or greater than R$1000 (see Table 2) received a correct classification percentage of events close to 83.5%, and the verisimilitude ratio test ($\chi^2 = 96.4727$; $p < 0.01$) suggests that the explanatory variables together seem to exercise a significant marginal effect on the dependent variable.

Table 3 shows that the fact that an individual alleges he knows the interest rates charged by the administrators of credit cards seems to have a significant association ($\beta_3 \cong -0.6555$; $p < 0.01$) with at least one of the four risk behaviors considered in this research. In other words, the marginal effect caused by the fact of knowing the interest rates reduces the probability of assuming risk behavior.

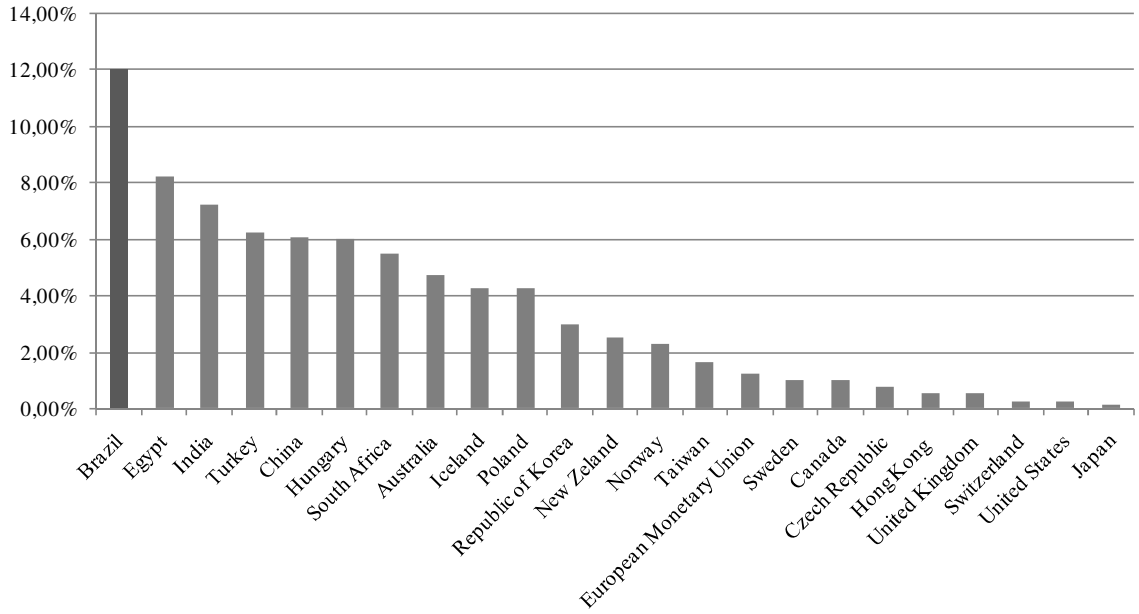
Table 1: Frequency (in %) of the profile variables of the respondents (in accordance with the risk extracts of the individuals)

Independent variables of the regressions (all dummies with the value = 1 if the affirmation was seen)	All students (N = 769)	Students with cc (N = 552)	No risk with cc (N = 358)	At risk with cc (N = 194)	Groups of students at risk (N = 194)			
					Debts on credit card ≥ R$1000 (N = 104)	Delay in paying cc bills (N = 49)	Does not pay full amount of card bill (N = 76)	Uses full limit of credit card (N = 51)
Demographics	-	-	-	-	-	-	-	-
Male	49.0	47.5	43.6	54.6	53.8	40.8	44.7	54.9
In relationship	5.0	4.6	3.1	7.4	12.9	6.5	2.7	3.9
Family lives in own home	90.7	91.0	92.7	88.0	90.3	81.6	84.0	88.0
1st generation to do degree	10.1	10.7	9.6	12.6	11.8	17.0	13.5	8.0
Lives in rented property/resid. hall	17.0	16.8	16.0	18.3	16.0	19.6	17.3	18.0
Obtained cc during/after college	44.6	62.2	62.9	60.8	60.6	63.3	60.5	52.9
Financial behavior	-	-	-	-	-	-	-	-
Financially independent of parents	24.1	26.3	22.2	33.9	40.4	38.8	34.7	28.0
Has 3 or more cc	12.2	17.0	12.0	26.3	34.6	28.6	23.7	25.5
Financial situation affects concentration	16.8	17.0	13.1	24.3	26.2	25.5	31.1	26.0
Sleeping diff. because of finances in past	21.1	21.1	16.3	29.8	35.6	31.2	37.3	26.0
Would do pers. finance course online	70.5	70.5	69.5	72.3	76.0	80.4	76.3	76.5
Would do pers. finance course at uni.	81.6	81.5	82.4	79.8	81.0	87.0	81.3	80.4
Knows cc interest rates	30.9	43.3	49.9	31.1	26.2	27.1	24.0	28.6
Uses cc to pay expenses of:	-	-	-	-	-	-	-	-
Education (e.g. books)	17.0	23.7	24.6	22.2	31.7	16.3	21.1	19.6
Clothes and pers. Items	46.2	63.9	66.8	58.8	65.4	53.1	52.6	60.8
Meals	28.3	39.5	41.6	35.6	40.4	26.5	31.6	29.4
Entertainment (e.g. cinema and theater)	37.7	52.4	53.1	51.0	47.1	46.9	47.4	47.1
Automobiles (e.g. fuel and maintenance)	20.2	27.9	25.1	33.0	44.2	20.4	22.4	27.5
Travel	19.0	26.1	26.0	26.3	40.4	14.3	19.7	19.6
Rent	1.6	2.2	2.0	2.6	3.8	6.1	2.6	2.0
Payment of accounts generally	4.9	6.9	6.1	8.2	9.6	14.3	10.5	5.9
Diverse expenses	6.5	9.1	6.4	13.9	20.2	12.2	14.5	9.8

Notes: % calculated based on valid frequencies (*i.e*. ignoring missing values). "Students with cc" represents students who have at least one credit card; "No risk with cc" identifies students who have a credit card but who have no risk behavior; "At risk with cc" identifies students who have a credit card and at least one risk behavior. The remaining columns classify students by risk behavior.

This suggests that a better level of education in personal finance may constitute a means of reducing the number of students at risk from using credit cards. Put another way, making students more aware of the cost of capital belonging to the institutions that administer credit cards may reduce their likelihood of using this type of funding; this line of argument supports the arguments of authors like Agarwal & Liu (2003). Furthermore, Brazil is considered to be a market whose basic interest rate is one of the highest in the world (see Graph 3).

Graph 3 – Current annual interest rates around the world in May 2011



Source: Prepared by the authors: http://www.fxstreet.com/fundamental/interest-rates-table/.

Also with regard to what is reported in Table 3, in line with what Black (2001) suggests, it seems that having a larger number of credit cards is associated with a greater likelihood of the student adopting some risk behavior ($\beta_1 \cong 1.2102$; $p < 0.01$). Of the four models reported in this section, in only one of them was the number of cards not significantly associated with risk behavior. The biggest marginal effect on the dependent variable was found in the explanatory model of the behavior of having a debit balance on the credit card equal to or greater than R$1000 ($\beta_1 \cong 1.5156$; $p < 0.01$), as detailed in Table 2 According to Woodruffe (1997), students with this type of behavior look for well-being vis-à-vis a reduction in high levels of anxiety. In short, according to the student's behavioral orientation, the use of the credit card may constitute an attempt to hide difficulties and weaknesses relating to their personality (Faber & Christenson, 1996). By way of illustration and interpretation of the coefficients estimated as significant, the probability of an individual having at least one risk behavior (see Table 3) would be approximately expressed as follows (4.1):

$$ln\left(\frac{\pi_i}{1-\pi_i}\right) = -0{,}5008 + 1{,}2102\beta_1 + \cdots + 0{,}6698\beta_{21} \quad (4.1)$$

Therefore, the probability, π_i, that a student ($\beta_{15} = 0$), who is financially independent ($\beta_{18} = 1$), aware that their financial situation can affect their academic performance ($\beta_{21} = 1$), who has more than 3 credit cards ($\beta_1 = 1$), knows the interest rates charged by their operator ($\beta_3 = 1$), is used to using their credit card to pay automobile

expenses (β_8 = 1) in addition to other bills (β_{12} = 1) would adopt at least one of the risk behaviors, would be calculated according to the following expression (4.2).

$$\pi_i = \frac{1}{1+e^{-\pi}} \therefore \frac{1}{1+2{,}718^{-(1{,}21-0{,}65+0{,}48+0{,}61+0+0{,}44+0{,}66)}} \therefore \pi_i \cong 0{,}9411 \quad (4.2)$$

Table 2: Probability (logit) of students adopting financial risks with debt and the punctual payment of bills (students with credit cards)

Variable	Having a credit card debt ≥ R$1,000			Being unpunctual (delay more than 2 months)		
	Marginal effect	Standard error		Marginal effect	Standard error	
Constant	-3.0360	0.7531	***	-2.0054	0.9308	**
1. Has more than 3 cc	1.5156	0.3005	***	0.7456	0.3843	*
2. Obtained cc during/after university	-0.2668	0.2924		0.0886	0.3836	
3. Knows cc interest rates	-0.7748	0.2846	***	-0.4886	0.3704	
4. Uses cc to pay education expenses	0.0335	0.3387		-0.5533	0.5757	
5. Uses cc to buy clothes and personal items	-0.0241	0.3076		-0.5045	0.3997	
6. Uses cc to buy meals	-0.1570	0.3470		-0.2931	0.4100	
7. Uses cc for entertainment expenses	-0.0595	0.3207		0.1710	0.3900	
8. Uses cc for automobile expenses	0.8376	0.2934	***	-0.5176	0.4943	
9. Uses cc for travel expenses	0.5517	0.3009	*	-0.8551	0.5728	
10. Uses cc for rent expenses	-1.0644	1.0311		1.9090	0.8391	**
11. Uses cc to pay bills in general	0.5445	0.5041		0.8956	0.5922	
12. Uses cc for other expenses	0.9038	0.3371	***	0.4886	0.5137	
13. Would take a personal finance course at university	-0.2869	0.4037		0.3633	0.4928	
14. Would do na online personal finance course	0.5715	0.3698		0.5950	0.4402	
15. Male	0.3679	0.2799		-0.5960	0.3563	*
16. In a relationship	1.0770	0.6318	*	0.3636	0.8224	
17. 1st generation in family to university	-0.3965	0.4737		0.3733	0.4367	
18. Financially independent of parents	0.5985	0.3059	*	0.4456	0.3727	
19. Lives in residence hall or rented property	0.0092	0.4413		-0.4928	0.5863	
20. Family lives in own house	0.5001	0.5057		-0.7554	0.5168	
21. Financial situation affects study concentration	0.3990	0.3699		0.4083	0.4065	
22. Has had trouble sleeping because of finan. situation	0.4161	0.3389		0.0214	0.4002	
N with $y = 1$ (Total num. considered in simulation)	95	(496)		41	(496)	
$R^{2\ of}$ McFadden	0.1991			0.1310		
% of correct classifications	83.5%			92.1%		
Akaike's information criterion	434.0570			291.8502		
χ^2 verisimilitude ratio test	96.4727	***		37.0896	**	

Notes: This Table shows the results obtained for the estimated coefficients for the Logit model for the two dependent variables (of the four used in this research). The initial set of data comprised 769 respondents, of whom 552 had a credit card, after discarding incomplete observations the number N of observations used in the regressions was smaller (reported in the lower part of the Table). The standard error for each marginal effect is indicated in the column to the right of each coefficient. The p-values are represented by: *p < 0.10; **p < 0.05; ***p < 0.01. The estimates were obtained with a robust standard error, using the procedure suggested by Davidson & Mackinnon (2004). cc = credit card. Estimates obtained using the *Eviews* 7.0® application.

Along this same line of thinking, but with regard to the impact that the financial situation may have on academic performance and well-being, observing the results of the estimates summarized in Table 3, it can be noted that the probability of the student not paying off the whole of the bill (β_{21} = 0.8222; p < 0.05) and the probability of having at least one of the risk behaviors being looked at (β_{21} = 0.6698; p < 0.1) is significantly greater among those who perceive that their concentration has been compromised because of their credit card debts. These results support the ideas argued by Norvilitis & Santa Maria (2002), according to which individuals who adopt risk behavior tend to have a greater stress level, which in some cases is reason for them committing suicide. This thinking supports the premise that positive behaviors when using credit cards constitute a means of maximizing well-being, to the extent that this financial instrument can offer convenience (Bernthal, Crockett & Rose, 2005).

Table 3: Probability (logit) being financially risky with regard to full payment and presenting some risk behavior (students with credit cards)

Variable	Paying only partial amounts of the bill			Having risk behavior		
	Marginal effect	Standard error		Marginal effect	Standard error	
Constant	-0,3732	0,7171		-0,5008	0,5428	
1. Has more than 3 cc	0,5047	0,3405		1,2102	0,2914	***
2. Obtained cc during/after university	-0,4944	0,3060		-0,2201	0,2246	
3. Knows cc interest rates	-0,7923	0,3101	**	-0,6555	0,2167	***
4. Uses cc to pay education expenses	0,0496	0,3710		-0,1662	0,2715	
5. Uses cc to buy clothes and personal items	-0,6459	0,2993	**	-0,3295	0,2340	
6. Uses cc to buy meals	-0,3268	0,3573		-0,2889	0,2516	
7. Uses cc for entertainment expenses	-0,2197	0,3340		0,0224	0,2393	
8. Uses cc for automobile expenses	-0,1993	0,3641		0,4834	0,2507	*
9. Uses cc for travel expenses	-0,4895	0,3857		-0,1701	0,2414	
10. Uses cc for rent expenses	-0,1293	0,9516		-0,7683	0,7537	
11. Uses cc to pay bills in general	0,7997	0,5703		0,5068	0,4066	
12. Uses cc for other expenses	0,6159	0,4179		0,6155	0,3296	*
13. Would take a personal finance course at university	-0,5036	0,3537		-0,4505	0,3013	
14. Would do na online personal finance course	0,2541	0,3463		0,3591	0,2703	
15. Male	-0,2309	0,3091		0,4686	0,2215	**
16. In a relationship	-2,0612	0,7731	***	0,3282	0,5349	
17. 1st generation in family to university	0,2567	0,4289		-0,0830	0,3620	
18. Financially independent of parents	0,4515	0,3048		0,4486	0,2421	*
19. Lives in residence hall or rented property	-0,2591	0,4349		0,0844	0,3115	
20. Family lives in own house	-0,3700	0,4520		-0,2310	0,3672	
21. Financial situation affects study concentration	0,8222	0,4034	**	0,6698	0,3480	*
22. Has had trouble sleeping because of finan.	0,4287	0,3793		0,2265	0,3020	
N with $y = 1$ (Total N considered in simulation)	70	(496)		172	(496)	
R^2 of McFadden	0,1254			0,1222		
% of correct classification	86,7%			71,6%		
Akaike's criterion	399,1068			608,0205		
χ^2 Verisimilitude ratio test	50,6449	***		78,2429	***	

Notes: This Table shows the results obtained for the estimated coefficients for the Logit model for two dependent variables (not paying off the whole of the bill and having at least one risk behavior in the use of a credit card). The initial set of data comprised 769 respondents, of whom 552 had credit cards, after discarding incomplete observations the number N of observations used in the regressions was smaller (reported in the lower part of the Table). The standard error for each marginal effect is indicated in the column to the right of each coefficient. The p-values are represented by: *p < 0.10; **p < 0.05; ***p < 0.01. Estimates were obtained with a robust standard error, using the procedure suggested by Davidson & Mackinnon (2004). According to the verisimilitude ratio test ($\chi^2 = 19.0521$), the model estimated for use of the full limit of the credit card seemed not to be very significant. cc = credit card. Estimates obtained using the *Eviews* 7.0® application. The parameters estimated for the fourth risk behavior, the fact that the student fully uses his credit card limit, were suppressed because they did not give satisfactory results for the adjustment measures used in this research.

5. Final considerations

The primary objective of this research was to check for the existence of associations between the profile of university students in the main financial center of a prominent emerging market, São Paulo/Brazil, and behavior considered "risky" in the use of credit cards. To do so the regressions' procedure with a binary response variable

(logit models) was used. Some 769 valid questionnaires were collected, from which 552 respondents alleged they both had and used credit cards. There were two main empirical results.

First, the estimated parameters in the regressions suggest that the number of credit cards that students use may significantly influence the likelihood of them developing behaviors seen as risky, when using this financial instrument, as Black (2001) argues. Secondly, there are significant indications that financial education can influence the behavior of students vis-à-vis their propensity for adopting risky behavior in their use of credit cards. In other words, students who alleged they knew the interest rates charged by the card administrators were, on average, less likely to adopt risky behaviors.

With regard to limitations of the research the following can be mentioned: i) data collection was restricted to a particular moment in the economy and to a metropolitan region with explicit peculiarities; ii) a fairly homogenous respondent public, e.g. age and income level, which makes it difficult to generalize from empirical findings; iii) the trustworthiness of the responses collected from the respondent public. The following are some of the practical implications of this research: i) positive financial behavior can be promoted through financial education on the university campus, which directly increases student well-being; ii) students need a better understanding of the importance of credit management and savings, thus avoiding risky behavior when using a credit card; iii) there is room for financial teachers and college administrators can encourage students to develop positive financial behavior, e.g. by developing integration programs between parents and their children; iv) financial education programs can pay special attention to how to approach financially at-risk students, e.g. forming groups with specific topics that are relevant to them.

The issues previously highlighted, as well as the limitations that are inherent in the design adopted in this research, are linked with the lack of studies that consider the Brazilian situation and suggest a promising research field in finance. The following are indicated suggestions for future research: i) test the models presented here, by expanding the group of respondents, especially in terms of the age bands and social strata (discussing the issue for groups that have profiles other than those of college students); ii) check for the existence of associations between citizen profile and the decision to use credit card services, since some individuals decide not to do so, even though there is reasonable consensus that this financial product makes a diversity of aspects possible that contribute to greater comfort and security in issues relating to consumption; iii) analyze the role of teaching institutions in delivering financial knowledge to university students; iv) explore the behavior differences in the use of credit cards between different markets, as advocated by Allen & Jover (1997).

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