

# Financial Behaviour and Financial Literacy among University Students

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## Abstract

The aim of this study is to determine the relationship between the financial knowledge and financial behaviour of university students across the following 5 European countries: Czech Republic, Estonia, France, Spain and Turkey. An online survey instrument was used for the study and the sample consisted of 418 university students. Data analysis was performed by using logistic regression. The study found that male students, those who have financial difficulties in sustaining their educational expenses and those who have loans or any other debts were more knowledgeable on personal finance. Students who do not have any credit card were also found to be more financially knowledgeable. Among the countries, students from France were found to be more knowledgeable on personal finance. Based on the findings, the article contributes to existing literature concerning the need to provide effective actions for the responsible use of credit cards in order to maximise the financial literacy of university students. Using debit cards instead of credit cards may be useful for better financial behaviour. This research may provide useful data for policy makers and card providers in devising the effective use of credit cards. The result of this research may inform university authorities in encouraging the teaching of financial knowledge among university students.

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## 1. Introduction

Financial literacy is one of the basic skills for sustainable living and it is also at the top of the global policy agenda. Some countries have begun to develop policies and strategies to increase the financial literacy of their citizens. The belief that better financial literacy skills leads to better financial decision-making has begun to be taken into consideration (OECD, 2012). Governments and some organisations have realised that financially knowledgeable citizens are essential for a nation's well-being. In addition, increased financial education has been considered very important, as it enhances socio-economic independence, credit analysis, appropriate financial choice in the marketplace and the ability to budget (Ramasawmy, Thapermall, Dowlut and Ramen, 2013).

Development and innovations in the internet and communication technologies have allowed people to reach products and services more easily than ever before (Braunstein and Welch, 2002). The liberalisation of markets and political reforms have revealed some risks for low-income families and elderly people (Jappelli, 2010). For this reason, policy makers have begun to express concerns that consumers do not have enough financial knowledge to enhance their well-being. It is believed that inefficient money management resulting from a lack of financial literacy could lead to behavioural patterns that make consumers vulnerable to serious financial crises (Braunstein and Welch, 2002).

The management of wellbeing and portfolio choice requires more sophisticated knowledge than ever before (Rooij, Lusardi and Alessie, 2012). In recent years, easy access to personal debt, home loan, investment borrowing and other payment alternatives have led to a rapid increase in consumption and household borrowing (Bird, 2008). Financial products have proven to be complex and difficult for financially unsophisticated investors to master (Lusardi and Mitchell, 2014). Some researchers have argued that individuals with a higher level of financial literacy and a higher cognitive level on financial literacy tend to be more responsible in their financial behaviour and credit card usage (Cole, Paulson and Shastry, 2012). Robb (2011) examined the relationship between the financial knowledge and credit card behaviour of college students, and they suggested that financial knowledge was a significant determinant in credit card decisions. The results also concluded that students with higher scores on personal financial knowledge were more likely to engage in more responsible credit card usage.

Financial literacy has wide-ranging implications for the stability of the entire economy. Well-informed consumers who have sufficient financial information are likely to save for the future and unpredictable situations (Jappelli, 2010). Financial literacy is important as it is beneficial to the financial system and general economy (Capuano and Ramsay, 2011). Increased financial literacy among individuals encourages financial institutions to give more innovative answers to consumer demands (Widdowson and Hailwood, 2007). Financial literacy is also beneficial to consumers in developing positive attitudes about money, and it provides them with the knowledge and skills required to assess the appropriateness of financial products and financial investments (Capuano and Ramsay, 2011).

Financial instruments have become complex and individuals are being provided with new and more sophisticated financial products. Access to credit is easier than ever before and opportunities to borrow are plentiful (Lusardi, 2008). Not only have households had to become more accountable for their own welfare, but the appearance of financial markets has also changed (Rooij et al., 2012). In order to become financially literate, all consumers need

to have the knowledge and skills to make the choices they need in the financial markets (Huston, 2010). New methods of earning and spending money have made it important for individuals to make effective choices about their financial situations, and to have necessary skills, knowledge and understanding in financial matters to make informed decisions (Financial Services Authority Basic Skills Agency, 2003). Hastings, Madrian and Skimmyhorn (2011) concluded that Mexican financial providers attracted investors looking for low-fee-index funds, even if they were essentially charging those investors a higher total price.

Financial skills and financial competence give people the ability to plan and solve financial problems (Financial Services Authority Basic Skills Agency, 2003). In this context, it is possible to increase the level of financial literacy of individuals by providing them with effective protection in financial markets, helping them to make informed decisions, providing appropriate and standard information about financial products, and providing better financial education (Valant, 2015). Consumers have to have financial knowledge in order to make informed choices. Consumers who have the necessary financial skills are likely to exhibit better economic behaviour (Bernanke, 2006).

The most widespread groups to focus on financial literacy have been college students and investors (Huston 2010). Understanding the impact of financial literacy on young people contributes to making market rules effective to protect young consumers. It also contributes to developing effective financial training programmes that target young people (Lusardi, Mitchell and Curto, 2010). Better investment knowledge is gained by financial courses during university education compared with pre-university finance courses (Peng, Bartholomae and Fox, 2007). Although studies have shown that high school level students have a high level of financial literacy, the level of financial literacy has also been found to be low in many studies conducted on university students (Shaari, Hasan, Mohamed and Sabri, 2013). The low level of financial literacy among young people may be due to them receiving inadequate information about financial knowledge from their parents, other adults or friends. From this point of view, schools are very important in terms of teaching financial information (Lusardi and Mitchell, 2014).

Financial literacy is strongly connected with other financial behaviour, such as having a bank account, and high levels of financial literacy have a positive impact on long-term saving behaviour (Hilgert, Hogarth and Beverly, 2003). On the other hand, while positive financial behaviours are shown in the form of budgeting, regular saving and the responsible use of credit cards, negative financial behaviour occurs in the form of exceeding credit limits, late credit card payment and not paying off credit card in full every month (Gutter, Copur and Garrison, 2010). In particular, financial behaviour is influenced by an individual's income level. Individuals with a high income level are more responsible for their financial behaviour (Perry and Morris, 2005).

In this framework, studies about financial behaviour and financial literacy are essential components for people around the world. Examining financial behaviour and financial literacy are important in understanding the use of financial services and future demand. The effective use of financial services and informed decision making about future demand are also important contributing factors to a country's economic and financial stability, general economic growth and sustainable development. In particular, cross-country studies about financial literacy can provide data for countries included in the research, which may yield striking insights into governments trying to engage in the development of dedicated national strategies on financial education. On the other hand, the expansion of economic activities in the market, such as internet purchasing, have made it harder than ever before

for individuals, and students in particular, to understand sophisticated financial instruments. This study can provide us with valuable information on financial behaviour and the financial difficulties faced by university students across the countries included in this study.

This study examined the relationship between financial literacy and financial behaviour among university students across 5 European countries: Estonia, Czech Republic, France, Spain and Turkey. The aim of this study is to determine the relationship between the financial knowledge and financial behaviour of university students. In order to achieve this, the following research questions were formulated:

- 1) What are the financial literacy levels in these countries?
- 2) Do socioeconomic and demographic variables affect the financial behaviour and financial literacy of university students in these countries?

Although many studies to measure financial literacy levels have been conducted in the past with the use of various questionnaires, not many studies exist that compare country-specific data using the same questionnaires. Most of the studies conducted in single countries have had unique variables and questions. This study is important in this respect. The lack of cross-country research on financial literacy also makes this research important. Assessing and comparing a country's performance with other countries can provide useful data for government authorities, and it can be an important first step in establishing targets for a healthy policy on financial literacy. The results of studies among countries in regard to financial behaviour and financial literacy may attract more attention from policy makers, and it may make them more sensitive about developing new and modern financial education programmes. These kinds of studies may also encourage researchers and government authorities to develop new financial education programmes, and to transfer the financial education programmes of countries with high levels of financial literacy to countries with low levels of financial literacy.

The first section of this study is a review of existing literature, which summarises some previous research conducted. The second section of this study concerns data and methodology, and it also describes data collecting and analysis of the data. The third section describes logistic regression analysis. The fourth section deals with the discussion, which analyses the results and compares them to previous studies. The conclusion is the final section and it contains some suggestions regarding the financial literacy and financial behaviour of university students according to the results.

## 2. Theoretical framework

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### 2.1. Definitional issues

Financial literacy has been variably defined as conceptual or operational in many ways by different researchers and organisations. As conceptual definitions, it has been defined as a specific form of knowledge, the ability or skills to apply that knowledge, perceived knowledge, good financial behaviour and financial experiences. Operational definitions have consisted of saving, investing, budgeting and borrowing (Remund, 2010). Thus, there are many definitions of financial literacy. The Jump\$tart Coalition for Personal Financial Literacy (2015) defines financial literacy as "the ability to use knowledge and skills to manage one's financial resources effectively for a lifetime of financial security". On the other hand, OECD/

INFE (2011) defines financial literacy as “a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being”. PISA defines financial literacy as “knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life” (OECD, 2015). Lusardi and Mitchell (2014) define financial literacy as the “ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt and pensions”. Huston (2010) defines financial literacy as “an additional application dimension which implies that an individual must have the ability and confidence to use his/her financial knowledge to make financial decisions”.

## 2.2. Determinants of financial literacy

Traditional finance theory uses models in which individuals are assumed to have little difficulty in making financial decisions. This theory has also assumed that individuals are well informed and consistent with utility maximisation. But the reality of the economic activities of individuals is not consistent with those assumptions. Individuals do not behave according to the assumptions made in the traditional finance theory of fifty years ago. Individuals make certain mistakes due to a lack of financial knowledge (Byrne and Utkus, 2013). Lusardi (2008) notes that individuals need financial knowledge beyond basic financial concepts to determine the relationship between risk and actual return in order to make effective financial decisions on saving and investing. Delavande, Rohwedder and Willis (2008) note that there is an important variation in financial knowledge in the population, even though traditional economic models assume that individuals act in a perfectly rational manner. They posit that higher levels of fluid financial knowledge are related to higher learning rates on financial sophistication items and the selection of riskier portfolios. Jappelli and Padula (2013) noted that financial literacy and saving have a positive relationship to each other. They also indicated that literacy and wealth are strongly correlated over the life cycle. Lusardi and Mitchell (2014) point out that increasing the level of financial knowledge in the early stages of life can produce optimal results. Hsu (2011) presented a model of the human capital investment process of longer-lived spouses over the life cycle and tested the model's predictions on financial literacy and financial decision-making. The results showed that older women do indeed plan strategically for the future by investing in financial knowledge as widowhood becomes more imminent.

There are some significant determinates to the financial literacy level of people (Table 1). First of all, financial capability increases with age, and it varies in a nonlinear way for males and females. This is in line with human capital theories, which suggest that people's abilities increase with their experience (Taylor, 2011). The level of financial literacy is positively correlated with education and income. The level of financial literacy also tends to increase as the level of education and income increases (Bhushan and Medury, 2013). Individuals living in cities generally have a higher level of financial literacy than those living in rural areas (Das, 2016). Individuals living in rental accommodation have a lower level of financial literacy than those who own their own home. Race and ethnicity also affect the financial literacy level of individuals (Lusardi et al., 2010).

### 2.3. Financial behaviour and financial literacy among youth

Developed economies have better economic and financial systems, and they spend more on the education of their students than developing and underdeveloped economies. According to education spending analysis from 2014, France spent 7,300 USD per primary student; Spain, 6,900 USD; Estonia, 6,700 USD, Czech Republic, 5,100 USD, and Turkey, 3,500 USD (OECD, 2017). Moreover, major financial literacy initiatives such as Commission for Financial Capability in New Zealand, the Financial Services Authority in the United Kingdom, the Financial Consumer Agency in Canada and the Financial Literacy and Education Commission in the USA have been adopted by a number of high-income countries. A rising interest in financial literacy issues has increased in both low and middle income countries by the number of conferences and workshops (Holzman, 2010). On the other hand, a large body of theoretical and empirical evidence suggests that larger and deeper financial systems help diversify risk and reduce the vulnerability of the economy to external shocks, thereby smoothing output volatility (IMF, 2012). A developed financial system gives individuals the possibility to make better decisions (Grohmann, Kouwenberg and Menkhoff, 2014). Well-informed and well-educated consumers make better financial decisions for themselves and their families. They feel secure in their economic activities. People who are well educated and have a high level of financial literacy provide a desirable labour force for employers. Parents who feel secure are more involved in their children's educational activities, enabling better educational and economic outcomes for their children. Financially literate people also foster community economic development. Therefore, being financially literate is important for individuals, their families, communities and societies (Hogarth, 2006). Financial knowledge can be statistically associated with financial practices, and financially knowledgeable people are more likely to engage in cash-flow management, saving and investment behaviours. (Hilgert et al., 2003). Kurihara (2013) examined the relationship between financial skill and economic growth and equality, and he suggested that financial skill could help people understand their economic world. He also suggested that it would give them the tools to make financial and economic decisions, and to promote business and economic growth.

Financial behaviour or financial attitude refers to individual behaviour related to money management including budgeting, borrowing, saving, spending and investing (Hilgert et al., 2003). Financial attitude and financial knowledge are significantly associated with financial management behaviour (Nguyen and Thao, 2015). Financial behaviour can be defined as any human behaviour related to money management (Xiao, 2008), and it is positively related to financial knowledge (Robb, 2011). Financially well-informed consumers are essential to an effective and efficient marketplace. Many financial education programmes have focused on providing information to consumers and operate under the assumption that an increase in financial knowledge will lead to changes in financial behaviour. (Hilgert et al., 2003). Although a decision on financial behaviour is influenced by economic factors and policy structures, it is ultimately made by individuals (Robb and Woodyard, 2011). Robb and Woodyard (2011) analysed the relationship between personal financial knowledge, financial satisfaction and some demographic variables, and they concluded that income has the most significant impact on financial behaviour, followed by financial satisfaction, financial confidence and education. Borden, Lee, Serido and Collins (2008) examined the link between financial knowledge and financial behaviour, and they noted that students



with higher avoidant attitudes towards credit cards reported less risky financial behaviour. They also concluded that students with more initial financial knowledge did report intending to engage in effective financial behaviours in the future. Robb and Sharpe (2009) found a significant relationship between financial knowledge and the credit card decisions of college students. They also indicated that students who had higher levels of financial knowledge had significantly higher credit card balances. Hilgert et al. (2003) found significant correlations between credit management and financial knowledge.

There have been many studies carried out among adults and young people on financial literacy. Most of the studies used demographic variables to evaluate the financial literacy of certain groups. Some studies have used the knowledge of financial instruments such as credit cards, debts or loans. Many studies have indicated that gender, age, income level, working experience, education level and residence have an impact on determining the financial literacy level among university students. Bael and Delpachitra (2003) investigated the financial literacy level among students at the University of Southern Queensland, and they found that students who had work experience and a high level of personal income had better financial knowledge and personal financial literacy. They indicated that male students had a higher level of financial literacy than female students. This result also showed that insurance information was one of the lowest known issues by students. Titko, Ciemleja and Lace (2015) investigated the financial literacy level of Lithuanian citizens, and they found that 7% of the economy programme students correctly answered the question about bonds, and 20% correctly answered the question about inflation. Krizek and Hradil (2012) explored the financial literacy level of university students in Czech Republic, and they showed that the mean percentage of correct answers was 56%. In addition, it was determined that the highest correct answer percentage was taken from the questions about credit card and loans. They also indicated that the lowest correct answers were from problem-solving questions. A study conducted by Shaari et al. (2013) showed that age, spending habits, gender, field of study and rank were basic determinants of financial literacy. In their study carried out in Albania, Nano and Cani (2016) found that students who took courses in finance or money management had a higher level of financial knowledge than those who did not take any course on finance.

Financial attitudes and education are also important in financial literacy. Albeerdy and Gharleghi (2015) showed that financial education, financial socialisation instruments and the attitudes towards money had a direct impact on financial literacy in Malaysian university students. They also found that education was the most influential factor on financial literacy. Borodich, Deplazes and Kardash (2010) investigated the financial literacy level among university students in the US, Belarus and Japan. They indicated that students across these three countries showed the highest achievement on the topic of earning income and the lowest achievement on the topic of saving. They also found a stronger relationship of correct student responses within countries and a rather low relationship across countries. Lusardi et al. (2010) examined financial literacy among young people using the US 1997 National Longitudinal Survey of Youth. They found that financial literacy was low; fewer than one out of three young adults had a basic knowledge of interest rates, inflation and risk diversification. They indicated that financial literacy was strongly related to sociodemographic characteristics and family financial sophistication. Tschache (2007) carried out a study in Montana State University and suggested that personal budgeting should be included in university education curricula.

## 2.4. Credit card usage and borrowing among young people

The easy access of credit may tempt students to live beyond their means. Excessive credit card debt can damage students' credit ratings and make it more difficult for them to obtain credit again. Moreover, students who are inexperienced with credit and have a lack of knowledge on personal finance are likely to be at greater financial risk of having large debt burdens when they graduate (Lawrence, Christofferson, Nester, Moser, Tucker and Lyons, 2003). There are some studies carried out about students' credit card usage and borrowing behaviour. Chen and Volpe (1998) surveyed 924 college students and they found that students with less financial knowledge tend to hold wrong opinions and make incorrect decisions in the areas of general knowledge, savings and borrowing and investments. Samy, Tawfik, Huang and Nagar (2008) conducted research to identify the determinants of financial knowledge among university students. They found that the credit card determinants were largely dependent on a student's year of study, status of credit card and daily routine. This result had a strong relevance to the respondents' knowledge about credit cards. A study conducted by Jones (2005) on first-year university students showed that 62% of the students had a credit card; 50.9% were indebted; older students had more credit cards compared to first year students, and the majority of students had little knowledge of credit cards. Barros and Peyp (2013) analysed the effects of financial literacy and financial behaviour on the probability of excessive borrowing, and they found that financial literacy and financial behaviour had a significant impact on excessive borrowing. They concluded that individuals who had a high income level had a low probability of excessive borrowing and show rational behaviour in the use of credit cards. They also indicated that young individuals who had a high income level had less financial hardship and over-borrowing. Research by Robb and Sharpe (2009) analysed the credit card behaviour of students in Midwestern University, which suggested that being financially independent was positively related to carrying a revolving balance. In addition, the research also indicated that being white was associated with a lower likelihood of carrying a revolving balance.

Table 1. Conceptual framework of financial literacy

Determinants	Financial knowledge	Financial behaviour
<ul style="list-style-type: none"> <li>• Gender</li> <li>• Age</li> <li>• Education</li> <li>• Marital status</li> <li>• Nationality</li> <li>• Income</li> <li>• Residence</li> <li>• Race and ethnicity</li> <li>• Working experience</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge about financial services and products</li> <li>• Knowledge about Money and risk management</li> <li>• Knowledge about interest, loans, insurance, inflation, tax, saving and investing.</li> </ul>	<ul style="list-style-type: none"> <li>• Budgeting</li> <li>• Borrowing</li> <li>• Saving</li> <li>• Spending</li> <li>• Investing</li> <li>• Paying bills on time</li> <li>• Having retirement plan</li> <li>• Keeping personal watch on financial affairs</li> <li>• Using debit or credit card/paying on time</li> <li>• Comparing prices</li> <li>• Responsible financial activities</li> </ul>
Financial literacy (Definitions)		
<ul style="list-style-type: none"> <li>• the ability to use knowledge and skills to manage financial resources throughout the life for financial security. (Jump\$tart Coalition for Personal Financial Literacy, 2015)</li> </ul>		
<ul style="list-style-type: none"> <li>• the ability to make financial planning, build and maintain wealth, make informed decisions on debt and retirement, and use economic knowledge. (Lusardi and Mitchell, 2014),</li> </ul>		



<ul style="list-style-type: none"> <li>• knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life (PISA 2012 definition, OECD, 2015)</li> </ul>
<ul style="list-style-type: none"> <li>• combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being (OECD/ INFE, 2011)</li> </ul>
<ul style="list-style-type: none"> <li>• ability to make informed and effective decisions about using and managing wealth and money (Gale and Levine, 2011)</li> </ul>
<ul style="list-style-type: none"> <li>• additional application dimension which implies that an individual must have the ability and confidence to use his/her financial knowledge to make financial decisions (Huston, 2010)</li> </ul>

Source: Compiled by the author based on literature

### 3. Method

The online survey for university students was designed using Google online hosting platform, which is an open access survey creation. The online survey was unrestricted, self-selected and open to the public for anyone to participate in, and it was shared on social media to collect data. Sample size determination was not made because it is almost impossible to do so for the online survey. Fully completed questionnaires were included in the analysis. The countries included in this study were selected in terms of geographically location. Given the positive impact of income on financial literacy, annual per capita income was also taken into consideration in country selection. France and Spain were selected from the western part of Europe. People in these countries have higher annual per capita income than other countries in this study. Czech Republic was selected from central Europe. Annual per capita income in Czech Republic is lower than that of France and Spain. Estonia has lower annual per capita income than France, Spain and Czech Republic, and it was selected from the northern part of Europe as a Baltic state. Turkey has the lowest annual per capita income in these counties, and it was selected from the eastern part of Europe as a candidate country for the European Union. The survey question was created following a review of existing research and was modified to suit this research needs (Chen and Volpe, 1998; OECD/INFE 2011; Lusardi and Mitchell, 2014; The National Foundation for Credit Counselling (NFCC), 2015). 418 students from Estonia, Czech Republic, France, Spain and Turkey were included in this study. The survey instrument comprised two sections. The first section had 8 questions about “gender”, “working experience”, “number of credit cards”, “daily budget”, “debt/loans”, “credit card payment”, “effect of financial situation” and “income source”. In the second section, students were asked to answer 10 questions on personal financial knowledge about “interest rate and inflation”, “currency exchange”, “time value of money”, “cost-benefit analysis”, “taxes”, “saving account”, “insurance”, “risk and investment”, “risk diversification” and “credit rating”. Cronbach’s alpha was 0.667. Logistic regression as a predictive analysis was used to determine the relationship between dependent variables and independent variables. Students with scores equal to or below the sample median of 8 were classified as less knowledgeable students on personal finance. This dichotomous variable was used in the logistic regression as the dependent variable. Reference categories were coded as 1, and other categories were coded as 0 for logistic regression. The coefficients of the independent variables represented the influence of each group compared with the reference category. When the logistic coefficient of an independent variable was negative, it was associated with the decreased log odds ratio of being more financially knowledgeable compared with the reference group. They are described in Table 2.

A logit transformation is used to link the dependent variable to the set of independent variables The logit link has the form:

$$\text{Logit}(P) = \log\left(\frac{P}{1-P}\right) \quad (1)$$

The model for the logistic regression:

$$\text{Logit}(P) = \log\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \dots + \beta_k X_k \quad (2)$$

$P$  is the probability of being more knowledgeable on personal finance, and  $1-P$  is the probability of being less knowledgeable on personal finance.

To analyse the relationship between dependent and independent variables, this logistic regression model was estimated:

$$\begin{aligned} \text{Log}[p/1-p] = & \beta_0 + \beta_1(\text{Male}) + \beta_2(\text{Working experience1}) + \beta_3(\text{Working experience2}) + \\ & \beta_4(\text{Credit card1}) + \beta_5(\text{Credit card2}) + \beta_6(\text{Daily budget}) + \beta_7(\text{Debt/Loans}) + \\ & \beta_8(\text{Credit payment}) + \beta_9(\text{Finance effect}) + \beta_{10}(\text{Income source}) + \beta_{11}(\text{Nationality1}) + \beta_{12}(\text{Nationality2}) + \\ & \beta_{13}(\text{Nationality3}) + \beta_{14}(\text{Nationality4}) \end{aligned} \quad (3)$$

**Table 2.** Description of independent variables

Gender (Male)	= 1 if a student is male, 0 otherwise
Gender (Female)	= <i>Reference category</i>
Working experience1	= 1 if a student has no working experience, 0 otherwise
Working experience2	= 1 if a student has up to 2 years of more of working experience, 0 otherwise
3 years or more	= <i>Reference category</i>
Credit card1	= 1 if a student has no credit card, 0 otherwise
Credit card2	= 1 if a student has 1 credit card, 0 otherwise
2 or more	= <i>Reference category</i>
Daily budget (no)	= 1 if a student does not budgets for his/her daily finance, 0 otherwise
Daily budget (yes)	= <i>Reference category</i>
Credit card payment (no)	= 1 if a student does not pay entire balance of his/her credit card on time, 0 otherwise
Credit card payment (yes)	= <i>Reference category</i>
Income source (parents or scholarship)	= 1 if a student's personal income source is his/her parents or scholarship, 0 otherwise
Income source (own income)	= <i>Reference category</i>
Financial situation (Less effective)	= 1 if a student's financial situation is less effective in meeting his/her monthly spending, 0 otherwise
Financial situation (Very effective)	= <i>Reference category</i>
Debt/Loans (no)	= 1 if a student has no loans or any other debt, 0 otherwise
Debt/Loans (yes)	= <i>Reference category</i>
Nationality1	= 1 If a student is from Estonia, 0 otherwise
Nationality2	= 1 If a student is from Turkey, 0 otherwise
Nationality3	= 1 If a student is from Czech Republic, 0 otherwise
Nationality4	= 1 If a student is from Spain, 0 otherwise
France	= <i>Reference category</i>

Source: Compiled by the author based on survey results

## 4. Results

Participation was higher among male students than female students. About half of the students did not have any credit cards or budget plan for daily finance. The majority of students did not have loans or any other debt. About 2 out of 3 students stated that they always pay the entire balance of their credit card on time. The main income source for students was either from parents or a scholarship. The numbers of participants were almost equal (Table 3).

**Table 3.** Descriptive analysis

Variables	Frequency	Percentage
<b>Gender</b>		
Male	194	46.4
Female	224	53.6
<b>Working experience</b>		
I do not have any working experience	56	13.4
0-2 years	294	70.3
3 years or more	68	16.3
<b>Number of credit cards</b>		
I do not have any credit cards	181	43.3
1	151	36.1
2 or more	86	20.6
<b>Daily Budget</b>		
Yes	211	50.5
No	207	49.5
<b>Debt/Loans</b>		
Yes	79	18.9
No	339	81.1
<b>Credit card payment on time</b>		
Yes	152	63.7
No	88	36.3
<b>Effect of financial situation</b>		
Very effective	138	33.0
Less effective	280	67.0
<b>Personal Income source</b>		
My working income	124	29.7
Parents or scholarship	294	70.3
<b>Nationality</b>		
Estonia	72	17.2
Turkey	86	20.6
Czech Republic	85	20.3
Spain	82	19.6
France	93	22.2

Source: Compiled by the author based on survey results

Table 4 shows the percentages of responses by countries. The highest scoring question of students from Estonia, Turkey, Spain and France was in insurance. Czech students had the highest score on the question of interest and inflation. The lowest scoring question of all

students was the time value of money. This result shows that students do not have sufficient knowledge about the potential earning capacity of money in the future.

**Table 4.** Responses by countries (%)

Questions	Estonia	Turkey	Czech Republic	Spain	France	Overall percentage
Interest and inflation	81	41	88**	75	76	72
Currency exchange	88	66	88	84	70	79
Time value of money	62*	31*	55*	50*	43*	48*
Cost-benefit analysis	75	62	75	67	70	69
Taxes	73	73	87	85	74	78
Saving account	87	82	75	79	82	81
Insurance	90**	87**	84	90**	91**	88**
Risk and investment	77	48	68	63	64	64
Risk diversification	65	46	58	68	65	60
Credit rating	68	82	69	81	80	76

Note: \*the lowest scoring question; \*\*the highest scoring question

Source: Compiled by the author based on survey results

Table 5 shows the results of the Omnibus Test of Model Coefficients and model summary. The logistic regression model has Wald statistics value of the Omnibus Test of Model Coefficients of 68.311 and is at the 0.001 level of significance. It seems that the proposed model suits the data well in developing a relationship between dependent variables and independent variables. The Hosmer-Lemeshow test, which has an insignificant Wald statistics of 9.671 at a 0.289 significance level, confirms that the Omnibus Test of Model Coefficients suits as a desired level. The overall fit of the model is given by -2 Likelihood statistics of 229.810. Nagelkerke R Square is 0.348. This R square is also evidence of explaining level knowledge by independent variables, and it shows that the model explains 34.8% of the variance of financial literacy. The sample correctly classifies 74.2% of respondents.

**Table 5.** Omnibus test of model coefficients and model summary

	Chi-square	df	Sig.
Omnibus Tests of Model Coefficients	68.311	14	0.000
Hosmer Lemeshow	9.671	8	0.289
-2 Log likelihood	229.810		
Nagelkerke R Square	0.348		
Classification	74.2		

Source: Compiled by the author based on survey results

Table 6 shows the result of the logistic regression analysis used to test whether there is a significant relationship between “gender”, “working experience”, “daily budget”, “loans or any other debts”, “effect of financial situation”, “number of credit cards”, “credit card payment” and “personal income source” and financial literacy. Output in the table indicates the coefficients and the odds ratios predicted by the logistic regression model. The regression model showed that six variables including “gender”, “number of credit cards”, “daily budget”, “debt/loans”, and “effect of financial situation” and “nationality” were statistically significant. The value of coefficient B indicates the direction of the relationship between a dependent

variable and the logit independent variable. In this study, male students had a positive coefficient of B of 1.547, and the exponentiated coefficient  $\exp(B)$  indicating odds ratio, which is a type of effect size measure, was 4.699 ( $p$ -value = 0.000). The male students are associated with increased log odds ratio of being more financial literate compared with female students. The odds of being more financially literate was likely to be 4.699 times higher for male students than female students. In other words, it indicates that for one unit change of the coefficient of male variable will increase the odds of a being financially literate by 32%. The students who didn't have any credit cards had a positive coefficient of B of 1.297, and it was statistically significant at the 0.1 level of significance. Exponentiated coefficient  $\exp(B)$  was 3.696. The odds of being more financially literate was likely to be 3.696 times higher for students who didn't have any credit cards than those who had two or more credit cards. The students who had one credit card had a negative coefficient of B of -0.708, and it was statistically significant at the 0.05 level. The students who had one credit card were associated with a decreased log odds ratio of being more financial literate compared with those who had two or more credit cards. The odds of being more financially literate was likely to be 0.493 times lower for students who had one credit card than those who had two or more credit cards. The students who budget for their daily finance had a negative coefficient of B of -1.039, and the exponentiated coefficient  $\exp(B)$  was 0.354 ( $p$ -value = 0.004). The odds of being more financially literate was likely to be 0.354 times lower for the students who budget for their daily finance than those who do not budget for their daily finance. The students who had loans or any other debts had a positive coefficient of B of 1.160, and the exponentiated coefficient  $\exp(B)$  was 0.314 ( $p$ -value = 0.006). The odds of being more financially literate was likely to be 0.314 times higher for students who had loans or any other debts than those who didn't have loans or any other debts. The students who indicated that their financial situations were very effective in sustaining their education and meeting their monthly spending had a positive coefficient of B of 1.153, and the exponentiated coefficient  $\exp(B)$  was 3.167 ( $p$ -value = 0.002). The odds of being more financially literate was likely to be 3.366 times higher for students who indicated that their financial situations were very effective in sustaining their education and meeting their monthly spending than those who indicated that their financial situation was less effective in sustaining their education and meeting their monthly spending. The variables of "paying a credit card on time", "personal income source" and "working experience" were statistically insignificant, which means that these variables had no significant impact on personal financial literacy. OECD/INFE (2016) International Survey of Adult Financial Literacy Competencies indicated that students from France had the highest financial literacy level among the 29 participating countries. According to these results, France was determined as a reference category for the nationality category in logistic regression analysis. Using France as the reference country, the signs and values of the coefficients for the other variables suggest the influence of country was stronger for Estonia (-1.285) and Spain (-0.994), but not for other countries.

**Table 6.** Summary of logistic regression analysis

	B	S.E.	Wald	df	Sig.	Exp(B)
Gender						
Male	1.547***	0.361	18.416	1	0.000	4.699
Female	(Reference category)					
Working experience						
No experience	-0.1096	0.805	1.853	1	0.173	0.403
0-two years	0.842	0.527	2.560	1	0.110	2.322
Three years or more	(Reference category)					
Number of credit cards						
No credit card	1.297*	0.778	2.783	1	0.095	3.696
One	-0.708**	0.352	4.030	1	0.045	0.493
Two or more	(Reference category)					
Daily Budget						
Yes	-1.039**	0.362	8.265	1	0.004	0.354
No	(Reference category)					
Debt/Loans						
Yes	1.160**	0.426	7.415	1	0.006	0.314
No	(Reference category)					
Credit card payment on time						
Yes	0.158	0.355	0.197	1	0.657	1.71
No	(Reference category)					
Effect of financial situation						
Very effective	1.153**	0.371	9.652	1	0.002	3.167
Less effective	(Reference category)					
Personal income source						
Parents or scholarship	0.566	0.403	1.968	1	0.161	1.760
My working income	(Reference category)					
Nationality						
Estonia	-1.285**	0.612	4.407	1	0.036	0.277
Turkey	-0.441	0.516	0.730	1	0.393	0.644
Czech Republic	-0.579	0.490	1.400	1	0.237	0.560
Spain	-0.994**	0.485	4.189	1	0.041	0.370
France	(Reference category)					
Constant	-1.368*	0.731	3.504	1	0.061	0.255

Note: \*p<0.1 \*\*p<0.05; \*\*\*p<0.01

Source: Compiled by the author based on survey results

## 5. Discussions

Logistic regression found a significant relationship between Estonia, France and Spain. Students from France were more knowledgeable than students from Estonia and Spain according to the logistic regression analysis. OECD/INFE (2016) indicated that students from France had a financial literacy score of 14.9 out of 20, and they were ahead of Estonia, Czech Republic and Turkey. Turkey had the lowest score (12.5 out of 20).

The results show that male students are more likely to be more knowledgeable than female students about personal financial literacy. There are many studies indicating that male students are more knowledgeable than female students about personal financial literacy



(Cole, Sampson and Zia, 2009; Fonseca, Mullen, Zamarro and Zissimopoulos, 2010; Lusardi et al., 2010; Beckmann, 2013; Atkinson and Messy, 2012; Bsuhan and Medury, 2013).

Students who have a basic knowledge of financial management and credit card usage, and those who use credit cards effectively tend to use fewer credit cards and have less risky financial behaviour (Borden et al., 2008). This study found that students who did not have any credit cards were more likely to be more knowledgeable about personal financial literacy than students who had one or more credit card. Toraman, Kılıç and Buğan (2016) investigated to determine the level of credit card literacy among college students. They showed that students used credit cards to cover one-third of their monthly expenses, but they couldn't pay the entire balance of their credit card. Although some studies suggested that increased financial knowledge was associated with improved credit use behaviour, Robb and Sharpe (2009) found that higher levels of financial knowledge were not significantly related to the decision to revolve a balance. Research by Hayhoe, Leach, Allen and Edwards (2005) found that students without credit cards scored higher in cognitive and behavioural credit attitudes.

The students who budgeted for their daily finances were more likely to be less knowledgeable about personal financial literacy than those who did not budget for their daily finance. This is an interesting result, as the level of financial literacy would be expected to be higher for those students who budget for their daily finances. This might be in relation to over-confidence. Over-confidence might decrease motivation to build financial capacity or knowledge (Harrison and Estelami, 2014). In the study by OECD/INFE (2016) analysing financial knowledge, financial attitudes and financial behaviour variables in 14 countries, it was found that certain respondents were over-confident, in that they didn't give correct responses rather than admitting that they did not know the answers. This result also showed that students do not have sufficient knowledge about budget planning.

The students who had loans or any other debt were more likely to be more knowledgeable about personal financial literacy than those who did not have loans or any other debt. This result was supported by a study carried out in Ohio State University by Murley (2016). He found that the financial literacy level of students with student loan debt was significantly greater than the financial literacy level of students without student loan debt.

The students who indicated that their financial situations were very effective in sustaining their education and meeting their monthly spending were more likely to be more knowledgeable about personal financial literacy than those who indicated that their financial situations were less effective in sustaining their education and meeting their monthly spending. Fosnacht and Dong (2013) found that students who experienced financial stress more frequently engaged in a variety of beneficial educational activities than students who did not experience financial stress. Even though this result is not directly related to this study, it shows the positive effect of financial difficulties. It can be suggested that financial difficulties might have the effect of increasing the responsibility of students on money management, and improving financial literacy.

This study showed that working experience had no effect on financial literacy. In a previous study, Bael and Delpachitra (2003) examined financial literacy among Australian University students and found that financial literacy improved with work experience and income. Ansong and Gyensare (2012) investigated the financial literacy of working students in Ghana and found that working experience was a positive predictor of university working-students' financial literacy. In this study, the impact of working experience on financial literacy was found to be insignificant. This result might be regarded as an expected outcome since university students, for the most part, do not have many years of work experience to affect their financial literacy.

## 6. Conclusions and implications

This study concluded that having one credit card or more has no positive impact on financial literacy since the financial literacy level is higher for students who do not have any credit card. Although it has been easy to access a credit card in recent years, improved financial awareness towards excessive credit card debt might have an impact on avoiding credit cards. Students understand the advantages and disadvantages of credit card usage. Student loans or any other debts have a positive impact on financial literacy. The responsibility of repaying a debt might have encouraged students to have more information about finance and improve their financial literacy. This study also found that financial situation is associated with financial literacy. The students who had some financial problems presented a high level of financial literacy. It can be concluded that financial problems might increase the positive financial behaviours of students who have some financial problems in sustaining their education and meeting their spending. Students should be encouraged to enhance their skills on borrowing, credit, saving, budgeting and spending management to enable them to manage their personal finances in order to achieve future goals.

In a practical sense, the article contributes to existing literature concerning the need to provide effective actions for the responsible use of credit cards in order to maximise the financial literacy of university students. Using debit cards instead of credit cards can be useful for proper financial behaviour. This research can also contribute to policy makers and card providers in devising the effective use of credit cards and debit cards, and provide insights to students and their parents in terms of using credit cards. The fact that students who make budgets had a low level of financial literacy indicates that they do not have sufficient and accurate knowledge on personal finance. This might lead to insufficient financial planning. These results inform university authorities on stimulating the learning of financial knowledge among university students via increasing extracurricular financial education programmes. Furthermore, universities should offer more required finance courses to students.

These results should be taken into consideration to enhance the financial knowledge of university students. All of these findings can be used to develop new approaches to the financial literacy of students by governments or private sectors. Based on the findings, it is recommended that more comprehensive further research be conducted to understand the relationship between the financial behaviour and financial knowledge of university students. This study can provide useful data to conduct new research on financial literacy in other European countries, and it can also be used to encourage university authorities and private institutions to develop and provide financial courses.

The main limitation of this research concerns the fact that the survey was conducted with 418 students across 5 European countries. The results of the study only represent students from the participating countries, and it is not possible to generalise the findings across all other European countries because of the small amount of the sample. A larger sample size is required for the generalisation of this study. An online self-selected survey and close-ended questions were used to collect data. It was not possible to obtain the desired sample. The survey was shared in English on social media. This situation may have restricted the participation of some students who do not have English.

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