

FINANCIAL BEHAVIOUR IN THE V4 COUNTRIES USING THE GLOBAL FINDEX DATABASE

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Abstract: *A person's financial literacy as well as their values, attitudes and beliefs all impact their financial behaviour, thus influencing their financial well-being. Our aim is to evaluate the situation in the V4 nations with respect to the financial behaviour of adults who own credit cards and have savings. We compare results from the different V4 countries using the Global Findex Database of 2011 from the World Bank. The relationship between the individual variables is examined using the binary response model Logit. Our results reveal that owning a credit card and having saved money within the past 12 months have significant relationships to the owning of an account at a financial institution, having borrowed money from any number of various lenders, as well as the demographic characteristics such as age, within-economy income quintile, education level and country of residence. People who borrowed money from a financial institution, or another private lender, are more likely to own a credit card and less likely to have saved money within the past 12 months. This work defines financial literacy and education from several authors' viewpoint. It describes the Global Findex Database and the binary response model, finishing with the results and their review.*

Keywords: *Financial Literacy, Financial Behaviour, Credit Cards, Savings, Global Findex Database, V4 Countries.*

JEL Classification: *G210.*

Introduction

The importance of financial education has increased in recent years as a result of financial market development, demographics, economic changes as well as policy changes. Today consumers have better access to a variety of credit and saving instruments provided by a range of different entities from banks, to brokerage firms to community-based groups [13].

Many people have a problem orienting themselves in the area of finance, banking and dealing with their personal budget. This means that it is necessary to address the financial education of people, thus raising their level of financial literacy.

Financial literacy is related to financial behaviour and consequently to the saving, borrowing, spending and investing decisions of individuals [12]. Financial behaviour is affected by financial literacy and other influences such as values, attitudes to risk, beliefs, experiences, etc. [10]. The way in which a person behaves will have a significant impact on their financial well-being.

Our aim is to evaluate the situation in the V4 nations with respect to the financial behaviour of adults who own credit cards and have savings. We then do a comparison of the results from the different V4 countries.

To accomplish this aim we use the Global Findex Database of 2011 from the World Bank to make our own V4 countries dataset. We look at the probability that a person may or may not own a credit card as well as the probability that they have saved money in the

past 12 months. For examining these probabilities we use the binary response model Logit, and have created two specific models. With our regression model results we are better able to understand and evaluate financial behaviour in the V4 nations.

1 Statement of the problem

1.1 Defining financial literacy and financial education

The term “financial literacy” has, like its relatives such as computer, statistical, visual, electronic and political literacy, become familiar. Like them, is a term that has an unclear meaning. For many users of these terms, “literacy” seems to be a synonym for “awareness” or “ability” or “mastery” or “skill”, and for others, “literacy” means only the ability to read and write, and they reject the use of the word as a metaphor for any other kind of ability. Reading and writing are skills necessary for the attainment of literacy, but they do not constitute literacy itself. To be literate is not only to be able to read and write, but also to understand that which has been read or written [3].

Many authors, such as Cackley [4], Houston [11] and Atkinson [1], understand the meaning of financial literacy and financial education and define them in different ways. Listed here are some possible definitions of these terms.

Financial literacy is defined as the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being. Individuals need to be equipped not only with a basic level of financial knowledge but also with the skills to apply that knowledge to financial decision making. Thus, financial literacy covers both financial education as well as consumers’ behaviour as it relates to their ability to make informed judgments [4].

Financial education is the process of improving consumers’ understanding of financial products, services, and concepts as well as consumers’ behaviour as it relates to their ability to make informed judgments [4]. Their understanding is improved through information, instruction, and objective advice which help them develop the skills and confidence to [13]:

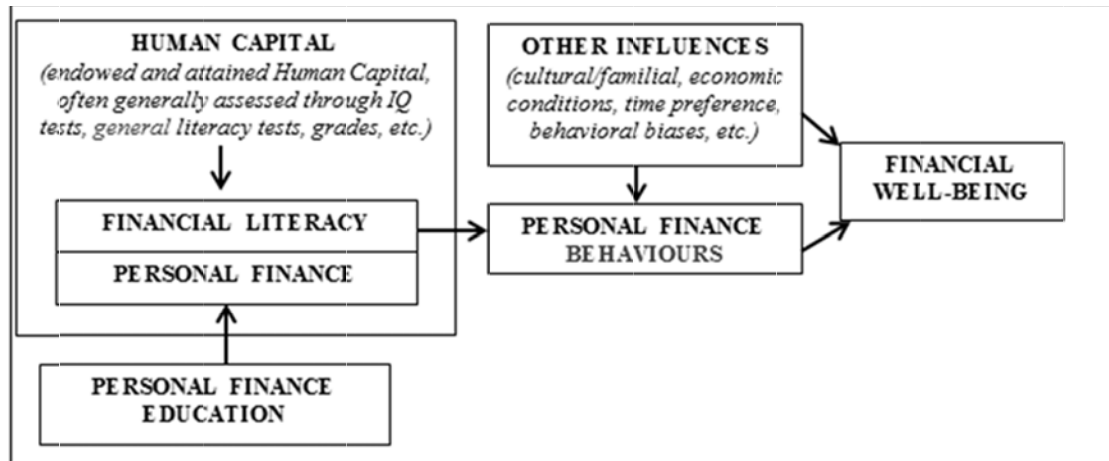
- Become more aware of financial risks and opportunities,
- make informed choices,
- know where to go for help,
- take other effective actions to improve financial well-being.

Other definitions of financial literacy affirm that it is “a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being [1].”

From another perspective, both financial literacy and financial knowledge are considered part of human capital, however they have different constructs. Financial literacy has two dimensions: understanding (personal finance knowledge) and use (personal finance application). While financial knowledge is an integral part of financial literacy, it is not equivalent to financial literacy, and has only a knowledge dimension (personal finance knowledge). Thus, financial literacy could be defined as measuring how well an individual can understand and use personal finance-related information [11].

Fig. 1 shows the relationship between financial knowledge, education, literacy, behaviour and well-being. This implies that financial behaviour is affected by financial literacy and other influences.

Fig. 1 : Relationships between Financial Literacy, Knowledge, Education, Behaviour and Well-Being



Source: [11]

Financial knowledge is basic knowledge of key financial concepts. Questionnaires test the level of financial knowledge covering a range of financial topics and varying in difficulty. These mathematical and logical questions have one correct answer [1].

All behaviour, including financial behaviour, is formulated and developed over a long time-period and is affected by many factors besides education, such as one's values, beliefs, attitudes, family environment, experience and personality [10].

The way in which a person behaves will have a significant impact on their financial well-being. It is therefore important to capture evidence of behaviour within the financial literacy measure. The surveys use different types of questions to determine behaviour, such as: thinking before making a purchase, paying bills on time, budgeting, saving and borrowing [1].

Financial education efforts are effective when participants start to demonstrate some or all of the following financial behaviours [10]:

- They keep track of their expenses and know how much they spend on various items such as food, transportation, housing, personal effects, entertainment, etc.
- They start building an emergency fund.
- They start saving regularly to meet their goals.
- They develop and keep current their cash flow and net worth statements to become fully aware of their overall financial situation.
- They pay credit card bills in full (not minimum payments) and carry no balance.
- They understand the basic principles of investing and make safe investments.
- They understand basic principles of risk management and take steps to protect themselves from various risks.
- Over time, the household financial statements show positive cash flow/net worth.

- They estimate financial retirement needs and develop a plan to meet those needs.
- They feel satisfied and in control of their finances.

Just because an individual is financially literate does not necessarily mean they will demonstrate good financial behaviour [15]. This means that a financially literate person could be influenced by other factors such as attitudes to risk, beliefs, values, etc.

To improve the financial behaviour of consumers it is necessary to set objectives for financial literacy programs to not only educate them about financial products and markets, but also to highlight the psychological biases and limitations that they, as humans, cannot easily avoid [15].

Based on the above mentioned definitions, we are inclined to accept the definition of financial literacy by Atkinson [1] which states that a mix of awareness, knowledge, skill, attitude and behaviour are necessary to make sound financial decisions and eventually achieve individual financial well-being. On one hand we focus on financial behaviour as an important part of financial literacy. On the other hand, we must not forget that financial behaviour is affected by financial literacy and other influences.

1.2 Global Findex Database

The Global Findex (Global Financial Inclusion) Database was initiated by the World Bank's Development Research Group using a 10-year grant from The Bill & Melinda Gates Foundation. It is the first public database of indicators that consistently measure how people around the world manage their day-to-day finances and plan for the future.

The 2011 database contains the first round of Global Findex indicators, measuring how adults in 148 economies, representing more than 97% of the world's population, save, borrow, make payments and manage risk, as well as use formal and informal financial services. The indicators are constructed using survey data from interviews by Gallup, Inc., with more than 150 000 nationally representative and randomly selected adults over the 2011 calendar year. The questionnaire was translated into 142 languages, and interviews were conducted face-to-face or via telephone. The complete set of Global Findex indicators will be collected again in 2014 and 2017. The target population includes the entire civilian, non-institutionalized adult population, age 15 and older. The individual-level data are publicly available online and include over 40 indicators related to account ownership, payments, saving, borrowing, and risk management.

Indicators that we think are particularly important for understanding the financial behaviour of adults include owning a credit card and an individual's saving behaviour.

From a list of economies included in the Global Findex survey, we use the V4 (The Visegrad Group) countries of Slovakia, the Czech Republic, Hungary and Poland to investigate the relationships of our chosen indicators and compare the differences.

Surveys were conducted face-to-face and interviews were conducted in the national language of each country. The collection period was approximately between April and May, 2011. Areas with a disproportionately high number of interviews in the sample are Bratislava, Prague, Budapest and Warsaw. The sample size in Slovakia is 1 012 individuals, in the Czech Republic 1 012, in Hungary 1 014 and in Poland 1 014 [7], [8].

2 Methods

Generally, regression models are used for examining the relationship between variables, but they are not suitable for every type of modeling. In particular, they should not be used when the dependent variable is discrete or limited [5]. Our dataset of the V4 countries, based on the Global Findex Database, contains mostly variables which are discrete and binary.

For this reason, we use a binary response model, Logit, in which the dependent variable y_t is binary. This means it can take on only two values, coded as either 0 or 1. Let P_t denote the probability that $y_t = 1$ is conditional on the information Ω_t , which consists of exogenous and predetermined variables. A binary response model serves to model this probability. Since the values are 0 or 1, it is clear that P_t is also the expectation of y_t conditional on Ω_t :

$$P_t = P_t(y_t = 1 | \Omega_t) = E(y_t | \Omega_t). \quad (1)$$

Thus a binary response model can also be thought of as modeling a conditional expectation, which must lie in the interval $\langle 0, 1 \rangle$, because $E(y_t | \Omega_t)$ is a probability. In order to prove that $0 \leq P_t \leq 1$ the models used are specified as:

$$P_t = E(y_t | \Omega_t) = F(\mathbf{X}_t \boldsymbol{\beta}), \quad (2)$$

while $\mathbf{X}_t \boldsymbol{\beta}$ is an index function, which transforms the values of variables \mathbf{X}_t into one real number (\mathbf{X}_t denotes a row vector of length k of variables that belong to the information set Ω_t) and $F(x)$ is a transformation function, which has the properties:

$$F(-\infty) = 0, \quad F(\infty) = 1 \quad \text{a} \quad f(x) = \frac{dF(x)}{dx} > 0. \quad (3)$$

These properties are, in fact, just the defining properties of the CDF (cumulative distribution function) of a probability distribution. The transformation function transforms a value (real number) of the index function into a value that lies in the interval $(0, 1)$ [5].

Binary response models are probability models in which estimates of coefficients of unknown parameters are estimated using a specific method. The Ordinary Least Squares method, however, is not the best choice. The mainly due to the fact that an estimate of the true (real) value \hat{y}_t may or may not lie within the interval $\langle 0, 1 \rangle$, which is a necessary condition of probability. By far, the most common way to estimate binary response models is by use of the method of Maximum Likelihood [9].

One of the available binary response models which fulfills the required condition $0 \leq P_t \leq 1$, is the Logit model. Its transformation function $F(x)$ is a logistic function

$$\Lambda(x) = \frac{1}{1 + e^{-x}} = \frac{e^x}{1 + e^x}, \quad (4)$$

which has the first derivative

$$\lambda = \frac{e^x}{(1+e^x)^2} = \Lambda(x)\Lambda(-x). \quad (5)$$

This first derivative is evidently symmetric around zero, which implies that $\Lambda(-x) = 1 - \Lambda(x)$. The Logit model is most easily derived by assuming that

$$\log = \left(\frac{P_i}{1-P_i} \right) = \mathbf{X}_i \boldsymbol{\beta}, \quad (6)$$

which states that the logarithm of the odds (that is, the ratio of the two probabilities ($P_i/1-P_i$)) is equal to $\mathbf{X}_i \boldsymbol{\beta}$. If we let $\Lambda(\mathbf{X}_i \boldsymbol{\beta})$ play the role of the transformation function $F(\mathbf{X}_i \boldsymbol{\beta})$ in the formula (2) when solving for P_i the result is [5]:

$$P_i = \frac{\exp(\mathbf{X}_i \boldsymbol{\beta})}{1 + \exp(\mathbf{X}_i \boldsymbol{\beta})} = \frac{1}{1 + \exp(-\mathbf{X}_i \boldsymbol{\beta})} = \Lambda(\mathbf{X}_i \boldsymbol{\beta}). \quad (7)$$

3 Problem solving

Our aim is to evaluate the situation in the V4 nations with respect to the financial behaviour of individuals owing credit cards and having savings. This is an important part of financial literacy. We then do a comparison of the results from the different V4 countries.

For solving this problem we use the Global Findex Database from 2011 to make our own dataset for the V4 countries. For examining the relationships between the individual variables we use the binary response model Logit. The specific dependent variables we have chosen for our two models are: ownership of a credit card and having saved money in the past 12 months. In both models there also exist independent variables from the general demographic characteristics of each individual which include: their age, gender, within-economy income quintile, education level, as well as country of residence. Other variables include: ownership of an account at a financial institution, using store credit, borrowing money from a financial institution, from family or friends, from an employer or from another private lender in the past 12 months.

The **first model** with a binary dependent variable examines the probability that a certain individual would own, or not own, a credit card. Meanwhile, additional independent variables used in this model include: the ownership of a debit card, saving money in the past 12 months and having a loan for a home or flat/apartment purchase.

Tab. 1: Logit model for dependent variable: Has a credit card

Coefficients	Estimate	Std. Error	z value	p value	LCB	UCB	Odds ratio	LCB	UCB
account at FI	1,323	0,188	7,050	0,000***	0,964	1,701	3,754	2,623	5,481
debit card	0,602	0,121	4,976	0,000***	0,368	0,842	1,827	1,444	2,322
saved money	0,007	0,093	0,078	0,938	-0,175	0,189	1,007	0,840	1,208
borrowed FI	0,930	0,126	7,398	0,000***	0,683	1,176	2,535	1,980	3,242
borrowed store credit	0,975	0,145	6,706	0,000***	0,690	1,260	2,651	1,993	3,527
borrowed family/friend	-0,153	0,125	-1,224	0,221	-0,402	0,090	0,858	0,669	1,094
borrowed employer	0,290	0,399	0,726	0,468	-0,506	1,067	1,336	0,603	2,908
borrowed private l.	0,980	0,442	2,219	0,027*	0,105	1,850	2,665	1,111	6,357
loan for home purcha.	0,265	0,140	1,897	0,058.	-0,011	0,538	1,304	0,989	1,712
gender_female	-0,169	0,088	-1,918	0,055.	-0,342	0,004	0,844	0,710	1,004
income_bottom	-0,534	0,145	-3,689	0,000***	-0,819	-0,252	0,587	0,441	0,778
income_second	-0,589	0,141	-4,166	0,000***	-0,868	-0,313	0,555	0,420	0,731
income_third	-0,391	0,130	-3,015	0,003**	-0,646	-0,138	0,676	0,524	0,872
income_fourth	-0,416	0,128	-3,258	0,001**	-0,667	-0,166	0,660	0,513	0,847
log (age)	-1,444	0,132	-10,908	0,000***	-1,708	-1,189	0,236	0,181	0,305
completed prim./less e.	-1,447	0,233	-6,221	0,000***	-1,922	-1,007	0,235	0,146	0,365
secondary educ	-0,406	0,106	-3,822	0,000***	-0,613	-0,197	0,666	0,542	0,821
Czech	0,509	0,115	4,421	0,000***	0,284	0,735	1,663	1,328	2,086
Hungary	-0,355	0,134	-2,653	0,008**	-0,618	-0,094	0,701	0,539	0,911
Poland	0,176	0,128	1,376	0,169	-0,075	0,427	1,293	0,928	1,533

Source: [Author]

Signif. codes: '***' p < 0,001, '**' p < 0,01, '*' p < 0,05, '.' p < 0,1, ' ' p < 1

Binary dependent variable: adult does not have a credit card = 0, adult has a credit card = 1. LCB: lower confidence bounds, UCB: upper confidence bounds.

Pseudo R2: Mc Faden = 0,211, 237 observations deleted due to missingness

The results in Table 1 (Tab. 1) reveal that the odds ratio for an individual who holds an account at a financial institution is 3.754 times more likely to possess a credit card than an individual who does not hold an account at a financial institution, where all the other variables are constant.

People who have debit cards are more likely to have credit cards than those who don't have debit cards. This may be due to the fact that banks are familiar with their own customers and offer them not only a debit card, but also a credit card. Today banks also offer credit cards to those in the lower income groups, but as our results show, the richest clients have a higher chance of having a credit card than those from lower income levels.

Moreover, the significant results of our analysis show that the likelihood that an adult will have a credit card is higher if they have borrowed money from a financial institution, used a store credit card or borrowed money via another private lender in the past 12 months. One explanation for this may be that people who have credit cards, and use them, are shown to have a greater chance of taking advantage of other forms of borrowing funds using various lenders. For this reason, it is very important that they properly manage these funds and avoid the complications associated with not making their payments on time.

Furthermore, adults who currently have a loan/mortgage taken to purchase their home are more likely to own a credit card than adults who do not have a mortgage. It is, therefore, essential that people that have both mortgages and credit cards are financially literate, and that they understand the consequences of the decisions they make concerning their household budget. They need to make their payments on time, keep from getting deeper into debt and reduce the chance of overextending themselves, then losing their place of residence.

In comparing the different groups of people that have credit cards, the results reveal that there are other significant variables that also influence the chances that a particular person will have a credit card. They include age, gender, income and level of education.

The odds for women having a credit card, are about 15,6% lower than the odds for men. For adults who have completed only primary school or less education, their odds of having a credit card versus not having a credit card, are 76,5% lower than the adults who have completed tertiary or more education. However, the odds for an adult who has completed a secondary education having a credit card, versus not having credit card, are only 34% lower than the odds for an adult who has completed their tertiary or more education. This means that the higher the education level an individual reaches, the higher the probability is that they will have a credit card. On the other hand, the older they are, the lower the probability is that they will have a credit card.

In high-income economies, 50% of the adults report having a credit card [6]. All the V4 countries are found among these high-income economies. However, only 19% of average adults report having a credit card, with the largest group being the Czech Republic (26,5%), followed by the Slovak Republic (20%), Poland (17,7%) and Hungary (15%).

When comparing the different V4 countries with Slovakia, the country effect reveals that the probability of owning a credit card in the Czech Republic is higher, and in Hungary it is lower, than in Slovakia. However, when comparing Slovakia to Poland, the results from this research on the country effect do not show Poland to be statistically significant.

The **second binary response model** examines the saving behaviour of adults and tries to explain the probability that they saved or set aside money in the past 12 months. This explanation explores which independent variables affect their saving behaviour. Additional independent variables included are: the ownership of a debit card, a credit card and/or mortgage/loan for a home or apartment. These results are displayed in Table 2 (Tab.2).

In reviewing the independent variables we see that the odds that an individual saved money in the past 12 months are 2,296 times higher if they borrowed money from an employer vs. not having borrowed money from their employer.

However, adults who borrowed money from a financial institution, from family or friends, or from another private lender are less likely to have saved money in the past 12 months. Of these three options, those who borrowed money from their family or friends are the least likely to have saved money. In general, we can then say, that the financial behaviour regarding borrowing of money has a significant relationship to the ability to save money.

People more likely to have saved money in the past 12 months are either individuals who have an account at a financial institution or those who are older. Financial institutions, for example banks, usually offer a package of services to those willing to open an account. A client is offered a variety of options for saving money using certificates of deposit or savings accounts along with their original account [2]. This implies then, that those with an account at a financial institution have a higher probability of holding an account where they are also saving money with interest. Older people tend to be more responsible and are thinking not only of their own financial future, but also the future of their family.

In comparing the different groups of people that have saved money in the previous 12 months, we see that there are two other significant variables that also influence the chances that they have put money away: income level and level of education.

When comparing those from the lower income brackets to the richest we find that the poorer are less likely to have saved. This may very well be due to the fact that they do not have disposable income over and above their regular household expenses. They often find themselves in the minus, which means it is hard for them to have put money aside.

Globally, 36% of adults report having saved or set aside money in the past 12 months [7]. In the V4 countries that average goes up to 39% where the largest group is in Slovakia (49,3%), then the Czech Republic (49%), Poland (30,8%) and finally Hungary (26,7%).

When comparing the situations in the different V4 countries to Slovakia, we find that only Hungary and Poland are statistically significant. Adults in Hungary and Poland are less likely than those in Slovakia to have saved money in the past 12 months. However, when comparing Slovakia to the other V4 countries, the results from this research on the country effect do not show the Czech Republic to be statistically significant.

Tab. 2: Logit model for dependent variable: Have saved money in the past 12 months

Coefficients	Estimate	Std. Error	z value	p value	LCB	UCB	Odds ratio	LCB	UCB
account at FI	0,759	0,111	6,812	0,000***	0,541	0,978	2,136	1,718	2,659
debit card	0,120	0,095	1,266	0,205	-0,066	0,306	1,127	0,936	1,357
credit card	0,051	0,093	0,553	0,580	-0,130	0,233	1,053	0,878	1,262
borrowed FI	-0,718	0,129	-5,565	0,000***	-0,973	-0,467	0,488	0,378	0,627
borrowed store credit	-0,154	0,145	-1,056	0,291	-0,440	0,131	0,858	0,644	1,139
borrowed family/friend	-0,767	0,111	-6,899	0,000***	-0,988	-0,551	0,464	0,373	0,576
borrowed employer	0,831	0,383	2,168	0,030*	0,093	1,608	2,296	1,097	4,991
borrowed private l.	-1,074	0,530	-2,025	0,043*	-2,227	-0,111	0,342	0,108	0,895
loan for home purchase	-0,095	0,135	-0,704	0,481	-0,359	0,169	0,910	0,698	1,184
gender_female	-0,034	0,073	-0,471	0,638	-0,177	0,109	0,966	0,837	1,115
income_bottom	-0,806	0,119	-6,751	0,000***	-1,041	-0,573	0,447	0,353	0,564
income_second	-0,567	0,117	-4,841	0,000***	-0,798	-0,338	0,567	0,450	0,713
income_third	-0,392	0,114	-3,452	0,001***	-0,616	-0,170	0,675	0,540	0,844
income_fourth	0,013	0,113	0,119	0,905	-0,208	0,235	1,014	0,812	1,264
log (age)	0,293	0,090	3,240	0,001**	0,116	0,470	1,340	1,123	1,600
completed prim./less e.	-0,886	0,142	-6,219	0,000***	-1,167	-0,608	0,412	0,311	0,544
secondary educ	-0,592	0,096	-6,150	0,000***	-0,781	-0,404	0,553	0,458	0,668
Czech	-0,011	0,097	-0,110	0,912	-0,201	0,180	0,989	0,818	1,197
Hungary	-1,055	0,103	-10,232	0,000***	-1,258	-0,854	0,348	0,284	0,426
Poland	-0,888	0,105	-8,481	0,000***	-1,094	-0,684	0,411	0,335	0,505

Source: [Author]

Signif. codes: '***' p < 0,001, '**' p < 0,01, '*' p < 0,05, '.' p < 0,1, ' ' p < 1

Binary dependent variable: adult has not saved or set aside any money in the past 12 months = 0, adult has saved or set aside money in the past 12 months = 1. LCB: lower confidence bounds, UCB: upper confidence bounds.

Pseudo R2: Mc Faden = 0,144, 237 observations deleted due to missingness

4 Discussion

Most people need to borrow money at some time. They may buy or renovate a house, invest in an education, or pay for a wedding. When they do not have enough money they then borrow from a bank, a cousin, or an informal lender. In some parts of the world, however, many people rely on credit cards to obtain short-term credit [7].

As a result of the extensive ownership of credit cards in high-income economies people have less need for short-term loans from financial institutions [6]. This may explain why the adults in these economies who report having received a loan in the past year from a financial institution (only 7% on average) is less than the V4 countries average of 9,7%.

Credit cards make a predetermined, limited line-of-credit available for a time without interest. However, if not paid in full within the grace period, i.e. 30 days, a minimum payment is due and the balance is then recalculated with interest for the following month [14]. Every credit card owner must then be financially literate to manage the borrowed funds, avoid the risk of going deep into debt, and guard financial well-being.

Saving behaviour is also considered an important component of financial literacy. It builds financial security while reducing reliance on credit. The amount a person can save and the length of time they can keep money aside varies. Financial literacy highlights whether or not respondents have saved money [1].

Atkinson et al. surveyed the financial knowledge, behaviour and attitudes in 14 different countries relating to their financial literacy: money management, short/long term financial plans, and financial product choice. Their findings, from an OECD International Network on Financial Education pilot study, included the V4 countries except Slovakia. Their research evidenced the following financial behaviours: thinking before making a purchase, paying bills on time, budgeting, and saving/borrowing to make ends meet. In each pilot country 1000 individuals were interviewed in 2010/2011. One question asked if a person had actively saved in the past year. Their results revealed that in Hungary just 27% and in Poland 51% had saved, whilst in the Czech Republic 72% had done so [1].

Interestingly, our study confirmed the same basic results, listing the V4 countries in the same order (without Slovakia, which they did not survey) when comparing the percentage of respondents that said they had saved money in the past year.

Tang et al. researched the financial behaviour and life satisfaction of college students. They used data from 976 completed surveys at a large southwestern state university in the U.S. Their study included three financial behaviour variables: expense management, balance control, and saving. They found that positive financial behaviour contributes to financial satisfaction which, in turn, contributes to life satisfaction. This positive financial behavior may refer to a wise individual that pays off their credit card balance monthly, saves money regularly or puts aside money for emergencies [15].

Xiao et al. also studied the effects of positive financial behaviour but on consumers of credit counseling services in the U.S. in 2003. They studied financially distressed consumers who telephoned for help with outstanding credit. Their 'Personal Finances Survey' indicated that consumers in credit counseling may follow a hierarchical pattern in their financial behaviour, first paying off debts and adjusting spending before considering saving. Consumers who are older, have a part-time job (vs. the unemployed), report a more secure retirement, a better family relationship, and a higher score on their self-evaluation of their financial behaviour are likely to report having more positive financial behaviour [17].

Conclusion

Financial literacy is related to financial behaviour and consequently to the saving, borrowing, spending and investing decisions made by individuals. This paper focuses specifically on the financial behaviour of individuals owning credit cards and savings, which is an important part of financial literacy.

Our aim was to evaluate the situation in the V4 nations with respect to the financial behaviour of adults who own credit cards and have savings. We compared the results from the different V4 countries. To accomplish this goal we used the Global Findex Database

of 2011 from the World Bank in combination with the binary response model Logit for a better evaluation of the financial behaviour of those in the V4 countries.

Based on the results of our models, definite differences are evident in the data from the different V4 nations. In Hungary people are less likely to own a credit card and are also less likely to have saved money in the past 12 months than are individuals in Slovakia. However, we see that in the Czech Republic it is the opposite, where they more likely to own a credit card. In comparison, those in Slovakia are more likely to have saved money in the previous 12 months than that those living in Poland.

Credit card ownership has a significant relationship to the demographic characteristics of age, gender, within-economy income quintile and education level. People who borrowed money in the past 12 months (from any number of various sources) are more likely to own a credit card. This highlights the need for increased financial literacy.

We can say then, that a person's financial behaviour regarding the borrowing of money, account ownership, as well as different demographic characteristics (other than gender) have a significant relationship to their ability to save. Owning a credit card as well as having saved money (for future expenses or emergencies) both impact a person's financial well-being. Those not aware of the need to save will therefore not save, and will have a higher probability of borrowing funds from various sources in the future. The level of an individual's financial literacy and their financial behaviour, with regards to owning a credit card and saving funds, have a definite impact on their financial well-being.

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