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THE CORRELATION BETWEEN FINANCIAL LITERACY AND PERSONAL SAVING BEHAVIOR IN VIETNAM



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ABSTRACT

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Keywords

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This study investigated factors impacting personal saving behavior in Vietnam. By using 692 respondents from a 63-province survey, the binary regression results showed that financial literacy, finance major, married status, financial attitudes, and advanced financial behavior were factors positively and significantly influencing individual saving behavior while gender, student, and basic financial behavior were factors negatively and significantly impacting saving behavior. It highlighted the result that, women had a higher probability of saving than men. The implications for financial education in Vietnam from the policy makers as well as personal perspective are also discussed.

Contribution/ Originality: This study contributes to the existing literature on the impact of financial literacy on financial behaviors. The study used 692 observations across a 63-province-level survey in binary logistic regression. The interesting result is that, in Vietnam, significantly, women were more frequent than men in saving. It is the first study to contribute findings consistent with the Vietnamese culture where women are the main financial decision makers in Vietnamese families.

1. INTRODUCTION

Asian Development Bank Institute (ADBI) 2017 and OECD's 2016 studies have shown that financial literacy has a positive impact on personal saving behavior, but there is very little research on this issue in low-income or lower-middle income economies. These studies found that Vietnam's financial inclusion index was significantly lower comparing to high-income countries, and that the use of formal savings tools was also quite low (ADBI, 2017). ADBI's study showed that the correlation between financial literacy and general education also affects saving behavior. Yet this study had not discovered the relationships between other factors like other countries' studies, such as comparing men and women's effects in individual saving behavior, which will be described below.

To consolidate and extend previous studies, and to effectively, specifically support interdisciplinary policies (financial and education), this study analyzed the impact of financial literacy and related factors on Vietnamese' individual saving behavior. As the result, policy recommendations can be made to harmoniously plan a financial literacy education strategy with current monetary and banking policies, as well as other development policies for Vietnam.

2. ESSENTIAL RESEARCH SITUATION

2017 ADBI's study overview showed that previous studies on financial literacy focused on two main fields: (i) factors affecting financial literacy, including age, sex, academic level, profession; and, (ii) the impact of financial literacy on individual financial behavior, including saving behavior, credit usage and retirement planning behaviors.

2.1. Financial Literacy: Concepts and Measurement

(i) Concepts

In 2013, World Bank (WB) mentioned a quite broad implication of financial literacy as "*financial management capacity*" of each individual member of society. Authors like Hogarth (2002); Remund (2010); Mahdzan and Tabiani (2013); Lusardi and Mitchell (2014); OECD/INFE (2016) have defined a more clarified meaning of the term: that financial literacy is formed through personal experience, expertise, and needs, and has a positive impact on individual involvement in the financial services market. Some organizations have defined *financial literacy* with universal admittance, such as OECD's International Gateway for Financial Education (OECD/INFE). They defined financial literacy as

"...a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being."

Within this study, the authors' summary about this term is: Financial literacy describes the status of knowledge and essential skill to make decision with potential financial consequence awareness, including (i) basic arithmetic skill; (ii) understanding of the benefit and risk tied with a specific financial decision; (iii) understanding of basic financial concepts; (iv) the ability of consulting, making accurate questions and understanding expert's basic advisory.

(ii) Measuring Financial Literacy

- *Financial Literacy Structure:* Researchers have always been developing methods for measuring financial literacy based on empirical tests, such as the Jumpstart Coalition for Personal Financial Literacy in 1997 (Mandell, 2009). Lusardi and Mitchell (2006) also included a questionnaire to measure financial literacy in health and retirement study on Americans aged 50-and-above from 2004. These studies provided a baseline for many subsequent studies.

Three core questions in initial surveying were designed to evaluate the understanding on some significant financial concepts like compound interest, operating margin and risk diversification. Subsequent studies, like OECD/INFE (2016); OECD/INFE (2015) were constructed on this baseline and integrated questions about financial attitude, financial behavior and financial experiences. According to OECD/INFE (2016) there are three components similar to the basic structure of an individual's capacity, including: (i) *Financial Knowledge*; (ii) *Financial Behavior*; (iii) *Financial attitude*; the components and combination of total points of the three components with a total value ranging from 1 to 21 will give us an assessment of the financial literacy.

- *Financial Literacy Measurement:* Regarding questions or tools for measuring "*financial literacy*", OECD/INFE (2015) has proposed 19 key questions. This set of questions implicitly requires a combination of financial knowledge, attitude, and behavior. In addition to the core questions, the questionnaire also consisted of a series of demographic questions, including gender, age, family status, geographic location, occupation, and income. These questions were selected according to three criteria: (+) questions that have been tested and proven to be high quality and unbiased; (+) questions have been used in national surveys; (+) questions related to the concept being measured. The questions were modified to meet the requirements and suitable for Vietnamese people and economic situations.

2.2. Financial Literacy and Financial Behavior

Financial literacy can be determined by many factors such as gender, age, career, education, financial socialization agents (Supinah, Japang, Amin, & Hwa, 2016) And then financial literacy impact individual's saving behavior, many studies were conducted to prove this.

Lusardi and Mitchell (2014) gave an overview on previous studies about relating factors and showed that the age cycle and financial literacy have a tendency to form a hump-shaped pattern. The financial literacy level tended to increase with age, then periodically declines as an individual grew older. However elderly people with high confidence in their financial literacy level did not suffer from this decline. In general, women have a lower financial literacy level than men, with the cause still left open, although women still have the tendency to admit they do not know the answers, compared to men. One's higher literacy compared to their parents also correlates with more positive financial literacy. These findings were once more affirmed in the OECD/INFE (2016) analysis of survey results conducted in 30 countries.

Lusardi and Mitchell (2008) argued that the financial literacy topic is particularly interesting for women who tend to live longer than men but have shorter work experience and lower earnings. By using the 785 respondents in the 2004 HRS module, their study points out that, in the United States, only about 29% of the surveyed women can correctly answer all three financial literacy level evaluating questions and that the older women show very low levels of financial literacy and there is a large number of women that have not made any retirement plans. Financial literacy and planning are closely associated: women who display higher financial literacy are more likely to plan and be successful planners. These findings raise concerns about the ability of women to make sound saving and investment decisions over a long retirement period.

Fonseca, Mullen, Zamorro, and Zissimopoulos (2012) made the study by using data from the RAND American Life Panel (ALP). The ALP consists of over 2,500 respondents ages 18 and over who are interviewed periodically over the Internet. Their research has shown that financial illiteracy is widespread among women, and that many women are unfamiliar with even the most basic economic concepts needed to make saving and investment decisions. They argued that the gender gap in financial literacy may contribute to the differential levels of retirement preparedness between women and men.

Ernst & Young (EY, 2017) points out that women's economic power and financial independence are growing rapidly around the world, making them an important market for the wealth management industry. However, many women view the investment industry as male-oriented and unwelcoming. It is concerning that, women commonly feel the wealth management industry is unwelcoming, patronizing, full of jargon and male dominated. A lot of men are uncomfortable with women wanting to work and earn and choose not to have a family or have other alternative lifestyle choices and a lot of men are often unaware of what a woman's life involves in terms of what they are required to spend on and save for etc. Globally, 67% of female investors feel their wealth manager or private banker misunderstands their goals or cannot empathize with their lifestyle. So it is not surprising that they misunderstand but it is up to them not the women to make an effort to understand their clients, it relates to customer service.

* Financial Literacy Level and Individual Saving Behavior.

Bernheim (1995); Bernheim (1998) pointed out efforts to measure financial literacy with other economy-financial behaviors. In America, correspond with higher diversification, Americans are interested more in their financial plan for retirement, especially after 2008-2009 global financial crisis. Hilgert, Hogarth and Beverly's study in 2003 found close correlation between financial literacy and daily financial management skill, while Christelis, Jappelli, and Padula (2010); Van Rooij, Lusardi, and Alessie (2011) found that people with higher financial literacy and the ability to calculate usually take part in financial market, stock trading and have preventive savings. People with higher financial literacy can successfully realize their retirement plan and accumulate more (Lusardi & Mitchell, 2011). These findings were proven in Malaysia.

Regarding family loans, Moore's study in 2003 pointed out that people with lower financial literacy levels have a higher probability of taking out more expensive mortgage loans. Campbell (2006) showed that people with low income and low education have less of a chance to restructure their mortgage during low interest rate periods. Stango and Zinman (2009) showed that people with limited arithmetic skills usually take out a loan more often and accumulate less.

** Personal Saving Behavior and Influencing Factors*

- *Financial socialization agents and financial behaviors:* Supinah et al. (2016) found that adults' financial attitudes tend to be statistically significantly influenced by reading materials like books, magazines or newspapers, electronic media such televisions and radios as well as self-development programs. While, social media and school curriculum provides *negative* differences to respondent's financial attitudes but not significant differences in influencing adults' behaviors;
- *The period of personal savings:* Studies often explain personal saving behavior with the theory of life-cycle saving theory (Modigliani & Brumberg, 1954). Accordingly, the saving behavior of an individual often follows the rule: when reaching high-income status, people often increase their savings and gradually reduce their spending; during retirement, individuals often use the money that has been saved before (Modigliani & Brumberg, 1954).
- *General literacy level and personal saving behavior:* In this regard, the research has made some remarkable conclusions: (+) Financial literacy and planning are clearly interrelated: those who displayed financial knowledge were more likely to plan and to succeed in their planning. Those who did plan were more likely to rely on formal methods such as retirement calculators, retirement seminars, and financial experts, and less likely to rely on family/relatives or co-workers. Most importantly, those who display higher financial literacy are more likely to save and invest in complex assets, such as stocks (Lusardi & Mitchell, 2006) (+) Financial knowledge and savings programs can be very effective in case of coping with serious diseases (thanks to savings) (Clark & d'Ambrosio, 2008). Even so, the process of learning how to improve the level of decision making on saving and investment is unclear (Maki, 2004).
- *Gender and personal saving behavior:* (i) Gottschalck (2008) showed that saving behavior differs between men and women. Women tend to have lower savings and assets than men as women often have lower income than men; Women also face more difficulties than men because they retire five years earlier than men; (ii) Levine, Mitchell, and Moore (2000) pointed out that there is a big difference between men and women in current income as well as the retirement plan. In general, there are significant differences between the two genders in terms of income sources such as savings, pensions and retirement income; (iii) Burnes and Schultz (2000): In most developed countries, the rate of poverty among women is statistically far higher than among men; (iv) Embrey and Fox (1997): The saving behaviors of men and women differ significantly. Sunden and Surette (1998) thought: Women seem to be less determined to save for retirement than men, although some other studies found this controversial. Thus, it cannot be said that women spend more than they make (Agnew, 2000).

** Personal Savings, National Savings, and Social Welfare*

It is necessary to distinguish between saving behavior and personal savings results. Personal savings are the result of saving behavior and most likely reflecting personal financial management capacity that depends on many other things. In terms of personal savings related to the national economy and social welfare, there are some studies that show the following:

- There is a close relationship between financial literacy and savings or the welfare of the household. Low level of literacy and lack of information affect the ability to save and to secure a comfortable retirement and

ignorance about basic financial concepts can be linked to lack of retirement planning and lack of wealth (Lusardi & Mitchell, 2007c).

- Shortage of asset and acceptance of higher interest rates on debt (Stango & Zinman, 2013). Governments in both developed countries and developing countries need to put more effort into improving people's financial knowledge so that they can participate in the financial market, and ultimately improve social welfare and reduce poverty in an inclusive and sustainable manner. Enhancing financial literacy and capacities will improve financial decision making, thereby leading to a boost in planning capacity, personal life management including education, health, buying a house, retirement, etc. and broadly speaking, ensuring social security (Lusardi & Mitchell, 2007).
- Savings not only bring benefits to individuals but also to the nation because they create a long-term capital supply for national development and thus contribute to economic growth. Savings are considered "protection" of some sort for the economic downturn or currency crisis (Tang & Chua, 2009). Savings should be supported by policies as savings are the source of growth through the impact on the capital structure. Thus high savings rates are synonymous with a "booming" economy rather than an economy at the "freezing" point (Tang & Chua, 2009).
- A country can raise its domestic savings by encouraging each individual to increase his or her savings. This can be done by improving people's financial literacy through training programs such as raising people's awareness of their financial situation, strengthening their capacity to plan their personal finances for the future, and providing appropriate financial tools to assist individuals in achieving their financial goals or welfare, etc. (Mahdzan & Tabiani, 2013).

As a result, all studies together showed strict correlation between financial literacy and saving behavior. Higher financial literacy level, with people understanding, and being able to effectively establish and use financial services leads to stable savings and then contributes to the sustainable development of the economy.

2.3. Vietnam Related Studies

Regarding Vietnam, the most prominent study is ADBI's study in 2017 because of its scale and range. The organization used OECD/INFE's standardized survey tool about financial literacy for adults to conduct research in two relatively low-income economies: Cambodia and Vietnam. Through this, they analyzed the crucial factors on financial literacy, and the influence of financial literacy on financial behaviors in these two countries. Cambodia's general total score (11.5) and Vietnam's (12.0) are low ranking amongst 30 studied countries. However according to ADBI (2017), the score is considered normal regarding such low-income economies like Vietnam and Cambodia. Literacy, income, age, occupational status are the main decisive factors for the level of financial literacy. Both financial literacy and general education level have a positive effect on individual saving behavior.

3. RESEARCH METHODS AND RESULTS OF STATISTICAL HYPOTHESIS TESTING

3.1. Sampling

The author randomly selected 780 individuals from all provinces in Vietnam. 700 questionnaires were distributed and 692 respondents provided answers (answer rate: 8.7%). Participants came from almost all provinces and economic regions (city, delta and mountainous area); and from all education levels, ages and gender.

3.2. Variables

3.2.1. Dependent Variable: Personal Saving Behavior

Personal saving behavior is considered a financial behavior on the basis that individuals have motivations and certain responsibilities for the future (social behavior) and, therefore, individuals often save rather than spending all their income; in other words that is the personal finance balancing ability. The research used saving regularity to

measure personal saving behavior. Thus, the regularity of personal saving was in accordance with the frequency of saving variable or how frequent saving is undertaken to backup for uncertainty and for the future.

Subjects were questioned with a five point Likert scale of saving frequency namely: never, rarely, occasionally, often and very frequently. Behavioral thresholds were delineated with one group showing "saving behavior" when an individual carries out saving for the future from "occasionally" to "very frequently" (considered positive behavior) and one group who rarely or never saves for the future (limited or negative behavior). Thus it was possible to assign binary variables to these behaviors, in which the value of "1" was used when saving for the future was carried out from occasionally to very frequently while the value of "0" was assigned in cases where saving for the future was rarely or never carried out.

3.2.2. Independent Variables

These variables measured "*financial literacy*", based on a number of questions applied by Lusardi and Mitchell (2007a); Lusardi and Mitchell (2007b); Lusardi and Mitchell (2007c); Lusardi and Mitchell (2008). Financial literacy was divided into two groups of indicators in accordance with the 02 corresponding levels: (+) Basic (Basic_Literacy); (+) Advanced (Adv_Literacy):

(i) Basic indicators group: to measure basic financial knowledge such as the influence of interest rate, inflation, risk distribution (diversify asset portfolio).

(ii) This group of advanced indicators were used to measure advanced level of people's understanding such as understanding of the stock market, trust funds and bonds with each correct answers getting "1 point", each incorrect answer getting "0 point" and the total number of points ranging from 0 to 13 giving us a measurement of the "intellectual level of finance" (financial literacy) or "Total Literacy". People who had a high score were considered knowledgeable and had a high level of literacy about finance and vice versa.

The research used the "FL_ps" variable as an inspection threshold: FL_ps got the value of 0 if the total financial literacy score was less than 50% of the total score (below average); FL_ps got the value of 1 when the total financial literacy score was equal or greater than the average (knowledgeable about finance, or above average score).

**Risk tolerance behavior* (Risk_Tolerance). Risk tolerance behavior was measured from 1 to 5: from point of being completely unwilling to accept any financial risks to the extent of being willing to accept very high financial risks. High level corresponded to high risk tolerance and vice versa.

**Demographic variables*: These variables are included in the detailed Table 1.

3.3. Research Hypothesis on Saving Behavior

The study predicts the relationship between dependent and independent variables according to Appendix 1; Variables to discover "information channels / knowledge source" to achieve "financial literacy level" from the average point or above are also included to test (conditional) in the model such as: from high school study, from radio, press and other materials.

Research hypotheses were developed based on the analysis framework as described in Figure 1.

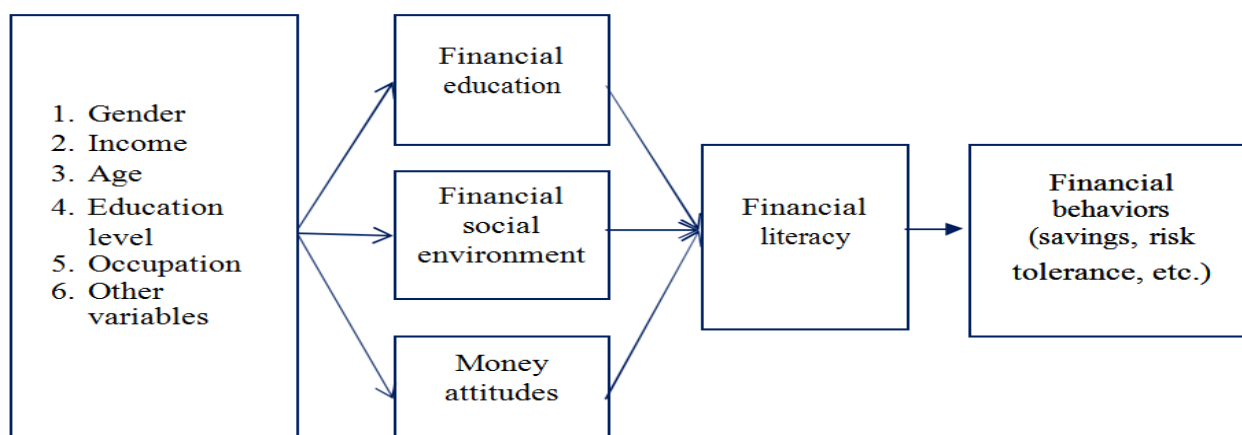


Figure-1. Analysis framework: relationship between education, financial social environment, money attitudes, financial literacy and behaviors. Source: Albeedy and Gharleghi (2015).

Based on the research overview and the analysis framework, the study tested the following research hypotheses:

Hypothesis 1: Financial literacy has the same directional impact on personal saving behavior (+).

Hypothesis 2: Individual demographic characteristics that affect personal saving behavior.

Hypothesis 2 can be divided into:

- (i) Age has a positive relationship to personal saving behavior (+).
- (ii) Different gender possess different personal saving behavior.
- (iii) The number of children has a positive relationship to personal saving behavior (+).
- (iv) The number of work-years has a positive relationship to personal saving behavior (+).
- (v) The income level has a positive relationship to personal saving behavior (+).
- (vi) Education level has a positive relationship to personal saving behavior (+).
- (vii) The level of risk tolerance is inversely related to personal saving behavior (-).

3.4. Analysis Model

The study is based on econometric models assessing the impact of "people's knowledge about finance" on "saving behavior" (Effects of Financial Literacy on Saving Behavior) according to ADBI's study (2017) (Peter J. Morgan & Long Q. Trinh, ADBI, 2017); and with reference to Mahdzan and Tabiani (2013) to determine the impact of financial literacy on personal saving behavior, the research will verify according to the following equation:

$$= + + + + (*)$$

In which: $Save_i$ is a dummy variable, which takes the one "1" value if the individual carries out saving money for the future (savings) from occasionally to very frequently and if he or she rarely or never saves money for in the future, this variable takes the zero "0" value;

FL_i measures financial literacy (point).

β_1 measures impacts of financial literacy on personal savings.

$Income_i$ is income of each person.

X_i is controlling vector.

ϵ_i is each error.

X_i includes gender, age, marital status, occupation, number of children (note that in principle, we test every information collected and provide as much as possible if that ratio is statistically meaningful).

β_0 is constant or free factor.

β_2, β_3 is correlation coefficients of impacts of income on savings; ϵ_i is error.

As mentioned above, since the dependent variable is a variable that takes two different values (dichotomous, duality), the research used the Binary Logistic analysis model. Binary Logistic analysis model uses binary regression or binary received value (obtain two values: 1 and 0). The test model was based on the theory to bring the impact factors (statistically significant, 5%) to personal saving behavior.

3.5. Testing Results and Results of Binary Logistic Regression Testing on Savings Behaviors

(a) Regression testing

References showed that the Wald test revealed that 08 variables in the model (Gend; Marr; Major; Student_y; FL_ps; AA; Bp and Bh with Sig respectively <0.05) had a statistically significant correlation with the dependent variable "Saving" with 95% confidence.

3.6. Binary Logistic Regression Results: and Analysis

According to information collected from 692 respondents the regression ratio test (Wald test) was conducted and showed that there were 7 variables (Gend; Marr; Major; Student_y; Bh; FL_ps; Rsk_behavior) with corresponding Sigs<0,05) with statistically meaningful correlation with the dependent variable " Saving Behavior" with 95% confidence.

Table-1. Variables in the equation.

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---------------------|-----------|--------|------|--------|----|------|--------|
| Step 1 ^a | Gend | -,401 | ,194 | 4,289 | 1 | ,038 | ,670 |
| | Marr | ,527 | ,211 | 6,208 | 1 | ,013 | 1,694 |
| | Major | ,930 | ,203 | 20,999 | 1 | ,000 | 2,535 |
| | Student_y | -1,144 | ,373 | 9,406 | 1 | ,002 | ,318 |
| | FL_ps | ,393 | ,196 | 4,006 | 1 | ,045 | 1,482 |
| | AA | ,681 | ,294 | 5,382 | 1 | ,020 | 1,976 |
| | Bp | -,765 | ,360 | 4,516 | 1 | ,034 | ,465 |
| | Bh | ,904 | ,268 | 11,354 | 1 | ,001 | 2,470 |
| | Constant | -,108 | ,243 | ,198 | 1 | ,657 | ,898 |

a. Variable(s) entered on step 1: Gend, Marr, Major, Student_y, FL_ps, AA, Bp, Bh.

(b) Model fit test:

(+) Forecast accuracy level of the model:

Table 2 (Classification Table), with 43 individuals rarely saving (see columns), the model correctly predicted 22 cases (see rows), so the accuracy rate was 12.4%. While 596 people often save, the model predicted 440 people, the accuracy rate was 95.4%. Therefore, the forecasting accuracy rate of the whole model (Overall Percentage) was 72.3%

Table-2. Prediction level of the model classification table ^a.

| | | Predicted | | | |
|--------------------|---------------------|-----------------------------|-----------------------------|--------------------|------|
| | | Frequency level of saving | | | |
| Observed | | Rarely and never | Occasionally and frequently | Percentage Correct | |
| Step 1 | Frequency of saving | Rarely and never | 22 | 156 | 12,4 |
| | | Occasionally and frequently | 21 | 440 | 95,4 |
| Overall Percentage | | | | 72,3 | |

Note: a. The cut value is, 500

(+) The relevance of the model:

The Omnibus test from Table 3 showed that sig <0.01 (99% confidence level), it was concluded that independent variables were linearly related to the dependent variable overall. Or that the chosen model was a good fit.

Table-3. Omnibus tests of model coefficients.

| | | Chi-square | df | | Sig. |
|---------------|----------------------|----------------------|---------------------|---|------|
| Step 1 | Step | 68,698 | | 8 | ,000 |
| | Block | 68,698 | | 8 | ,000 |
| | Model | 68,698 | | 8 | ,000 |
| Model Summary | | | | | |
| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square | | |
| 1 | 687,352 ^a | ,102 | ,147 | | |

Note: Estimation terminated at iteration number 5 because parameter estimates changed by less than ,001.

(c) Simulation of the probability of changing personal saving behavior

In Table 4, results from the regression coefficient column "B" and column $[\text{Exp}(B)=e^B]$ were used, forming the probability scenario that changes when then initial probability is 10%, 20%,30%,40% and 50%.

If set: P_0 : Initial probability; P_1 : Changed probability. Then, P_1 was calculated by the following formula:

$$1 = \frac{0 \times}{1 - 0(1 -)}$$

The results were shown in "Table 4". This table simulates how the probability of personal saving behavior changes.

Table-4. Simulation of the probability of changing personal saving behavior.

| Variables | B | Exp(B) | 1- E | 10% | 20% | 30% | 40% | 50% |
|-----------|--------|--------|--------|-------|-------|-------|-------|-------|
| Student_y | -1.144 | 0.318 | 0.682 | 3.4% | 7.4% | 12.0% | 17.5% | 24.1% |
| Bp | -0.765 | 0.465 | 0.535 | 4.9% | 10.4% | 16.6% | 23.7% | 31.7% |
| Gend | -0.401 | 0.67 | 0.33 | 6.9% | 14.3% | 22.3% | 30.9% | 40.1% |
| Major | 0.93 | 0.535 | 0.465 | 5.6% | 11.8% | 18.7% | 26.3% | 34.9% |
| FL_ps | 0.393 | 1.482 | -0.482 | 14.1% | 27.0% | 38.8% | 49.7% | 59.7% |
| Marr | 0.527 | 1.694 | -0.694 | 15.8% | 29.8% | 42.1% | 53.0% | 62.9% |
| AA | 0.681 | 1.976 | -0.976 | 18.0% | 33.1% | 45.9% | 56.8% | 66.4% |
| Bh | 0.904 | 2.47 | -1.47 | 21.5% | 38.2% | 51.4% | 62.2% | 71.2% |
| Constant | -0.108 | 0.898 | 0.102 | 9.1% | 18.3% | 27.8% | 37.4% | 47.3% |

The above test showed the factors that influence (statistically significant) the behavior of personal saving in order: "Major in undergraduate study" (Major); "Advanced social behavior" which involves responsibilities for the future (Bh), "Financial attitude" which involves both attitude to risk, attitude to money (AA) ; "Marital status" (Marr); "Financial literacy" (FL_ps);

(vi) "Gender" (Gend); "Basic social behavior" covering responsibilities for current resources (Bp);

"Student's academic year" (Student_y).

Meanwhile, the test did not find (not statistically significant) the impact of "age" (age), "job experience" (Exp_job), "number of children" (Child), "income" (Income), "education level" (Edu),

... and basic channels (such as high school study; short-term training; mass media such as television, radio and press; official research papers ...) to personal saving behavior.

(d) Personal saving behavior prediction model

After eliminating non-statistically significant variables, performing Binary Logistic regression analysis, results were obtained and displayed in "Table 1" (above section). And therefore:

$$=+++++_+_+ + + (**).$$

Replacing the coefficients in Table 2 (above) into the equation (**):

$$= -0.401 + 0.527 - 0.93 + 1.144 - 0.393 + 0.681 - 0.765 + 0.904 - 0.108$$

The equation estimates the probability of having personal savings as follows:

$$E(Y/X) = \frac{e^{\text{LogOdd}}}{1 + e^{\text{LogOdd}}}$$

$E(Y/X)$: is the probability where $Y = 1$ (positive personal saving behavior exists) when the independent variable X has a specific value of X_j

Table-5. Predicting factors affecting personal saving behavior according to scenarios.

| | Regression | Scenario 1 | Scenario 2 |
|---|-------------------|-------------------|-------------------|
| Variable name (if correct, value = 1) | coefficient | (KB1) | (KB2) |
| Gender Male | -0.401 | 0 | -0.401 |
| Married | 0.527 | 0 | 0.527 |
| Undergraduate study major: Banking and finance | 0.93 | 0 | 0.93 |
| Student of the second year or above | -1.144 | 0 | -1.144 |
| The level of financial literacy is at average or higher | 0.393 | 0 | 0.393 |
| Have good attitude (average) towards banking and Finance | 0.681 | 0 | 0.681 |
| Basic social behavior related to banking activities from an average level upwards | -0.765 | 0 | -0.765 |
| Advanced social behavior related to banking activities from the average level upwards | 0.904 | 0 | 0.904 |
| Block coefficient (intersecting the vertical axis) | -0.108 | -0.108 | -0.108 |
| $P(Y/X_j)$ | | 47.3% | 73.4% |

There were hypotheses on variables to predict saving behaviors. "Predicting factors affecting personal saving behavior according to scenarios" (Table 5) was based on results of variable hypotheses, which provide the following predictions as follows:

The first scenario (KB1): If the individual had the following characteristics (elements): not male sex; not married; the major in undergraduate education is not banking and finance; being a student under the second year; the level of financial literacy is below average; the attitude towards banking and finance is below average; basic social behavior related to banking activities is below average; and, advanced social behavior related to banking activities is below average; then the probability of having positive saving behavior was 47.3%.

The second scenario (KB2): If the individual had the following characteristics (elements): male gender; married; the major in undergraduate education is banking and finance; being a second year student or above; having financial literacy level of above average; attitude towards banking and finance is average or higher; basic social behavior related to banking activities is average or above; and, advanced social behavior related to banking activities is average or above; then the probability of having positive saving behavior was 73.4% (i.e. at least occasionally, regularly and very frequently save for protective needs or for the future).

3.7. Discussion on factors influence Personal Saving Behaviors in Vietnam

Predictions, simulation of above hypotheses and, particularly, results of Binary Logistic Regression on data collected from 692 respondents in different areas showed that there were 7 factors affecting personal saving behaviors in Vietnam and that:

- Some results were in compliance with ADBI's study, such as: those with high financial literacy have high possibilities of positive savings (from occasionally to frequently for provisions). The new finding compared to ADBI's study (2017) was that marital status and university major have positive impacts

on savings. The same result was also seen in advanced social behaviors (including behaviors in correspondent to interested resources and future responsibilities).

- Particularly, regarding to gender, the study showed that women tended to have higher possibilities of positive saving behaviors (frequently) than men, in other words, the saving or attitude, was more common in female than in male. Meanwhile, ADBI's study (2017) did not point out the relationship between gender and personal savings in Vietnam and other studies. Gottschalck, (2008) also concluded that saving amount and frequency of women was lower than men in other countries. This explanation of authors is in accordance with Vietnamese culture where wives are considered as thrifty and being important people directly taking financial care of their family and children. They usually control all family budgets (even if they are not breadwinners as their husbands).
- Risky behaviors, people with high risk tolerance rarely save money (in contrast to those with low risk tolerance often having positive savings). Students (Student_y), save less in later school years.

4. POLICY IMPLICATIONS

Based on the test results and the context of low level financial literacy compared to developing countries, official financial instruments at low levels (ADBI, 2017), black credit in the country, the Government's effort towards a comprehensive financial strategy and education reform and practice of financial education in Vietnam, the authors make some suggestions as below relating to financial education to increase personal savings, and thereby enhance national savings and achieve macro-economic objectives for Vietnam's socio-economic development:

- The test results showed that financial literacy has a positive impact on personal saving behavior, so in general, the Government should have an overall strategy on financial education in order to enhance financial literacy in a comprehensive and in-depth approach for generations and public people. For example, by providing appropriate economic and financial training to all levels of education (especially when Vietnam is reforming education towards practical skills rather than theoretical knowledge); and at universities particularly. To solve this problem, it is essential to strengthen in-depth coordination among related industries, particularly between the banking sector (not only the State Bank but also commercial banks and specialized institutions) and education sector (schools). Currently, the comprehensive financial strategy has not obtained coordination among related industries and there is no positive response from the education sector. Therefore, this coordination should be improved to bring suitable, professional, systematic and effective financial training into learning curriculum at all levels (primary, secondary, high schools, etc.) on the basis of national interests. After that, every individual should improve his own financial literacy, have a positive view and make a good use of his financial resources and enhance saving capacity.
- The study shows that the study major at the undergraduate education has a positive impact on saving behaviors. This is linked to the practice of economic and financial training at universities, suggesting that the Government and the Ministry of Education and Training, and universities in particular, should find solutions aiming to expand and enhance in-depth economic and financial training more effectively for university students, such as, strengthen financial and economic training for non-finance students and increase subjects related to personal financial management (not only for finance and banking students). At high school level, it is necessary to bring advanced education of financial literacy into the law amending the law on education and training; enable students to get used to financial and banking products and to access student loans and gradually encourage saving habits, even when they are not working and making money.
- The study also shows an unfavorable relationship between risky behaviors and saving behaviors, while financial literacy has a positive impact on financial behaviors. With reference to study results of ADBI (2017) on the use of public savings instruments and considering practical financial behaviors in Vietnam such as debt (black credit), gambling (high return), it is suggested that there should be training to improve financial

and banking literacy for all public community through appropriate channels or integrated educational programs in rural and remote areas. Black credit cases and financial frauds in 2016 have proved that it is essential to enhance financial literacy, which will be the basis for people to have safe savings.

- We believe that, to achieve these, there should be a strong basis or evidence of the relationship between financial literacy and borrowings outside the banking sector of the public community (especially in rural areas) through extensive research or surveys for more specific recommendations.
 - Regarding financial education for all genders, ages and women in particular: it can be seen through the results of this study that in Vietnam, women often take care of financial management for themselves, for the whole family and even for companies or state agencies. So, financial education and enhancement of financial literacy for the public will be solutions to minimize unsafe financial management activities. Banks and financial intermediaries should take professional measures to provide their customers with training on financial awareness, monetary usage and attitudes, safe and effective investment as well as to increase public access to banking and financial products in order to minimize black credit.
 - Banks should identify women as their target customers and design products suitable for their time (after working, cooking, etc.), based on their characteristics such as gift-loving, reward-loving, interested in products for their children, or establish savings funds and banks for women.
 - Enhance propaganda to raise awareness on the importance of financial education for all sectors and levels to ensure that the national strategy on financial education in Vietnam in the coming years will be introduced and effectively implemented to gradually increase public savings, especially of women, at the same time, enhance national savings. contributing to sustainable growth of Vietnam.

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