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FINANCIAL LITERACY AS DETERMINANT OF STOCK MARKET PARTICIPATION

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ABSTRACT

The study focused on how an individual's financial literacy influences his participation in the stock market including other demographic factors of age, risk, income level, household influence and education. Financial literacy was seen from the perspective of an individual's financial knowledge on investments, savings, budgeting, basic numerations, and general personal financial management.

This study adopted quantitative techniques and methods to understand the dynamics of how financial literacy is a determinant for stock market participation and simultaneously how an individual's financial decisions to invest in the stock market is dependent on the influences from his nuclear household. This study was niched to Estonia and all respondents contacted via online platform using questionnaire. A total of 240 respondents were used for this study and a cross sectional data was created, regressed and conclusions thereof.

The relationship of financial literacy and stock market participation was reconfirmed but significantly having an increasing effect of one unit with a corresponding increase on stock market participation. Additionally, an individual's financial decisions relative to the stock market based on influences from his nuclear household (positive or negative) was concluded to be statistically significant but negatively affects stock market participation.

Keywords: stock market participation, financial literacy, behavioural finance

ABBREVIATIONS

Education (EDU)

Employed (EMP)

Financial Literacy (FL)

Household (HSH)

Income (INL/Incm)

Organisation for Economic Co-operation and Development (OECD)

Risk Aversion (RAV)

Stock Market Participation (SMP)

INTRODUCTION

Financial inclusion of individuals in a community or nation has been attributed to weak financial infrastructures or system, lack of indigenously designed banking services, etc. however, the increase or decrease in the statistics of financial literacy based on stock market participation has been a wiggly research where some attribute the information from nuclear households, marketing ads and others. In the same vein, the risk attitudes of individuals from their tolerance of high to low may also contribute to their stock participation levels. So, how then does financial literacy determine stock market participation, to what extent?

First, the term 'financial literacy' has to be defined. How then should a financially literate person be described? For an average individual, a financially literate person has the basic knowledge of properly investing, budgeting and financial management (Fernando, 2021). The level of financial literacy of individuals to invest in stocks or bonds for example may be different from investing in more complex financial instruments like derivates or warrants. This is because of the level of knowledge possessed by these individuals which are strong determinants for their financial risk tolerances, 'word of mouth' experiences from friends and family and their financial capabilities to invest. In modern times, the fear of an uncertain financial future in terms of retirement, medical needs or financial stability, individuals have been financially active in both risky and less risky assets to prepare for the future. According to (Arts, 2018), people with low financial literacy have the propensity to not invest in stocks or bonds and thus influence their financial decision making in the long run.

The end goal of stock market participation is to grow wealth, usually in the long run (Nadeem, et al., 2020). This is expected to be a motivation for individuals to contribute heavily in the stock markets but this is considerably low. In Europe for example, the statistics for SMP (stock market participation) for a country like Estonia is below 10% and the highest Sweden at 53% (Arts, 2018). These are still low numbers in comparison to technological advancements, education levels, age and other demographics. Additionally, the pandemic has further reiterated the need for more selfless and essential investments that can simply have future guarantees and

financial stability. This has resulted in thirst for capital investments in bonds (less risky) than shares (risky) by individuals across all ages and according to OECD (2020), the stock market is ready to accumulate as much as possible to revive the current financial crisis caused by the pandemic. Although, many (Fernando, 2021; Nadeem, et al., 2020) have argued that stocks are long term investments not fit for long term financial goals because of the constant trading and fluctuations in prices/volatility, but the importance of investing in them is key for smooth running of capital raised by firms who in turn provide payable employments, expand their operations and foster the economic development of the country. With low participation rates in Europe generally, "market liberalizations and structural reforms in pensions and social security plans have induced individuals to become more responsible for their own financial prosperity".

The objective of this study is to examine the relationship between SMP and financial literacy and if any, identify reasons for low SMP. Additionally, this study attempts to understand the dynamics of how important information from individuals in a nuclear household are able to encourage the statistics of participation in the stock market. The data to be retrieved for this study is to be generated through distributed questionnaires to individuals based on categorized groups explained in chapter 3. The information is expected to be weighed against their financial literacy to participate in the NASDAQ Tallin Stock Exchange. Since the respondents are in Estonia, questions with the term "stock market" refers to NASDAQ Tallin Stock Exchange.

Therefore, to understand the relationship between SMP and financial literacy and examine if financial literacy is a degerming factor for SMP, the following are the research questions to be answered:

A. To what extent does financial literacy have on stock market participation?
B. Can the financial literacy level of an individual affect the stock market participation in a nuclear household?

The other chapters of this study are organized as: literature review that attempts to examine past literature on the subject of discourse, methodology on the collection of primary data with the use of questionnaire and regression as analytical method as well as the fourth chapter that presents data analyzed and retrieved and conclusion. The final chapter recommends for further studies and other aspects that have been uncovered in the study as well as recommendations to key stakeholders like the government on ways to better encourage SMP.

1. LITERATURE REVIEW AND HYPOTHESES

This section of the study examines the importance of financial literacy generally, influencing factors of financial literacy, measurement of financial literacy as well as financial literacy relatable to stock market participation.

Previous definition of Financial literacy defines it as a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decision and ultimately achieve individual financing wellbeing (OECD, OECD, 2015). Financial literacy is graded as low or high. This means there are no middle grounds on financial literacy. However, David (2021) argues that individuals can be financially literate, semi-literate, low literate and nonliterate. According to him, financial literates are those who have acquired financial skills and above average (and upwards) with some level or more knowledge on basic financial instruments and trading (including personal finance skills of budgeting and financial management) like stocks or bonds and have average (or above) level knowledge of more complex assets like derivatives and have high propensities to have diverse asset portfolios (David, 2021). Semi-literates are those who fall at the average category of being partly literate on all levels including trading. Low level literates are those who do not have financial skills from training of any kind but are able to gather viable information from friends and family and use this to make financial decisions. This does not mean that the literate and semi-literate do not use information from nuclear households, but this is more important for low literate category. Nonliterates are individuals who are financially oblivious and like semi-literates, they are susceptible to being cajoled into high rated mortgages or other long-term investments with unrelatable high risks (David, 2021).

The increasing demand for savings and future investments at this time is evidently creating a different shift in global financial sectors. Although, other individual factors order than financial literacy influence SMP such as age, gender, wealth, risk aversion, and education (Arts, 2018), the average income/wealth in Europe are not fluctuating negatively like SMP (as seen in Appendix 1).

1.1. Importance of Financial Literacy

Financial literacy is a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decision and ultimately achieve individual financing wellbeing (Organization of Economic Co-operation and Development, 2005). Despite its digitization, the stock market still looks herculean to the average individual. Most of its products can easily be termed complex and difficult to understand especially for those who do not have prior background in finance.

In an existing study by Lusardi and Mitchell (2006), those with little or no financial knowledge are less likely to have a concrete plan for retirement or a nest egg. Often, they rely on financial advice from family and friends. Except in rare occasions where they are savvy enough to have an investment advisor, they often fall prey to high interest mortgages or low interest savings options from the banks.

Christelis et al (2011) highlight the influence education plays in the range of stock related decisions an individual make. This is buttressed by Vaarmeet et al (2019) who insist that individuals with more educational degrees and a higher-than-average IQ are more likely to participate in the stock market. This implies that those with poor financial and educational knowledge have a higher fear of the risk involved in the stock market and this greatly hinders their participation.

The need for financial literacy can no longer be over emphasized. It is no longer the sole responsibility of the government to provide for your wellbeing at retirement. Rather, individual financial decisions now play a huge role in their quality of living post-retirement. Kiyosaki et al (1998) gives financial literacy a higher value than money itself. One's awareness of the various options available to grow his financial portfolio will determine their wealth and financial status especially at retirement.

As a body, the Organization for Economic Co-operation and Development has funded several studies to measure the financial literacy of several countries. The measurement of financial literacy is a key tool that aids policy makers in identifying gaps and implementing effective programs to close these gaps.

1.2. Factors Influencing Financial Literacy

The importance of financial literacy cannot be overemphasized. This ranges from knowledgeable skills on financial budgeting and savings but can be summed to simply help source, create, and manage money more efficiently. Previous study shows that with financial education, people will manage their finances effectively and become an asset that increases earning benefits in return (Roy, 2020). Additionally, the overall effect of good financial literacy on an individual can be summarized as improved rates of savings, lower levels of debt, increased rates of asset accumulation (FEC, 2021). There have been several factors attributed to influencing individuals' financial literacy that ultimately affect their participation in the stock market. These factors include but not limited to:

A. **Demographic factors**: this was identified by (OECD, OECD, 2015) as one of the key socio-economic factors that influence the level of financial literacy in individuals. This includes age, Gender, marital status/partner status and income level (David, 2021). For example, high income earners tend to be more financially literate than low-income earners (OECD, Financial Stats: Financial Literacy, 2017) or younger people between ages 15-35 having little or no financial literacy on investments, savings and others (OECD, Financial Stats: Financial Literacy, 2017).

B. **Knowledge and skill:** Having basic education at minimum of secondary school level can possibly have financial literacy on investments and future financial planning. According to Statistica (2021), Estonia has 35.9% of its population having tertiary education between ages 15-64 (highest being Ireland at 40.5%) and in 2018, 49.7% of its population have secondary education (EuroStats, 2018). Therefore, targeted individuals in this category can be educated on financial literacy and all that it entails, its benefits for themselves and others around them.

C. **Information accessibility:** In this present time of sophisticated technology available anywhere and at convenience and where stock market trading, purchases and sale (or resale) are available via smartphones or the internet generally, many have argued that the complexities of the stock market are still not easily understood by the layman. Information is power but can only be power to those who can access, assess and understand it.

D. **Family backgrounds:** This factor is directly linked to cultural and religious beliefs, upbringing values, behavior, and attitude. The attitude of spending extravagantly or thriftly, risk takers or risk averse, budgeting and saving etc. are peculiar in different households. Some individuals may have all, less or more of these and exhibit these that factors into their

literacy levels. Additionally, information or experience (positively or negatively) from a nuclear household has a high probability of influencing stock participation of other individuals of that household or others around them.

1.3. Measurement of Financial Literacy

Financial literacy is generally measured in order to ascertain, determine and identify loopholes that needs to be filled in order to have a sound financial literate population by government/policy makers or key stakeholders. For this study, similar parameters set by OECD (2017) is used like "direct and open-ended questions" to collect useful data from respondents in Estonia. These parameters include: financial knowledge, behavior and attitude and demography. First the respondents have to understand the age group they fall into (including their income levels), then their financial knowledge, and finally the subject matter of this study, their behavior and attitude towards investments (stock market participation). This is measured based on the scale of highest to lowest (1-10)

Demography:

This captures social demographic of respondents. This includes the age, gender, education and income levels. Results from measurements of financial knowledge and behavior are compared and interpreted along demographic lines.

The average monthly income according to Trading Economics (2021) is €584 i.e., $686 (National Monthly Wage (NMW)) (CountryEconomy, 2021). For this study, below the NMW of Estonia is assumed to be low income or otherwise high income at above €1000.

Underaged respondents are below 18years of age, higher education/job seekers are in category 18-25; 26-33, 34-41, constitute the highest age group of Estonia's workforces while retirees and pre-retirees are categorized at above 50years.

Financial Knowledge:

The questions designed for respondents to measure their financial literacy on basic numerations/stock market knowledge based simple questions are shown below:

Index/Scores	Financial Literacy (FL) Level
<25%	No FL
25-40%	low FL
41-65%	Average FL
66-75%	Intermediate FL
>75%	Highly FL

Table 1: Computed by Researcher.
Source: (OECD, 2017)

Behavior and Attitude

The behavior and attitude parameter focuses on using realistic/relatable (scenario-based) questions in examining respondent's behavior to savings, budgeting, and investments as well as their attitude to spending money and risk tolerance. As a result, analysis from the results is weighed to determine the factors or influencers or their disposition to acquiring more financial knowledge and sharing to others (David, 2021).

1.4. Financial Literacy and Stock Market Participation

The stock market is the engine of the financial sector of any country. The financial infrastructure of an existing financial system is important, but speed driven by the stock market. Here, companies raise long term funds either as debts and then convert to assets or simply raise their capital base, exchange intangible assets at trading values, create jobs and stabilize the economy as whole.

The significance of an existing stock market in any country is imperative yet dynamic in every form. The stock market is not only institutionalized to trade financial instruments, raise funds from money and capital markets but also creates avenues for free participation for common investors "to participate in the financial achievements of the companies, make profits through capital gains, and earn money through dividends, (although losses are also possible)" (Chen, 2021). According to Nadeem, et al. (2020), investors simply participate in stock markets activities to increase wealth or generate wealth that can be reinvested or taken out from investment to meet a need. Thus, participation in the stock market refers to the act of purchasing shares of companies with the intention of increasing wealth in the long run. Despite huge stock market participation numbers over the years, studies like Yoshihiko, Mostafa, and Naheed (2017) and Nadeem, et al., (2020) have shown that financial literacy has a huge influence on

individuals and household participation. Major factors that influence SMP include but not limited to: risk attitudes (risk seeker, risk averse, risk neutral) (PMWares, 2018), household limitation, price volatility of stocks, financial capacity, financial literacy, peer pressure, educational level, demographics, etc.

Nadeem, et al. (2020) studied 'how investors attitudes shape stock market participation in the presence of financial self-sufficiency'. Their study reiterated the importance of financial literacy and the factors that influence how 'investors' money attitude' shape their SMP decisions. The study niched on a circle of respondents who were active investors unlike households (like Zhou (2018)). Based on the theory of planned behaviour, their study used structural equation modelling for determination of relationship in constructs and confirmatory factor method for analysis of interrelationship presence between selected variables and constructs. The study also conducted a survey of questions on active investors and concluded that risk attitudes and investors' money attitudes affect stock market participation. It highlighted that personal values are also key indicators that stricken the level of SMP but this was not covered in their study.

Anthony (2020)'s study covered 'the influence of financial literacy on SMP amongst university lecturers in Tanzania'. The study with a quantitative approach examined the level of financial literacy amongst university lecturers of all areas in Tanzania and how much knowledge they have about investments affect SMP. With a total of 50 respondents, ANOVA and regression were used to analyze answered survey questions. The study produced results that the respondents were highly literate but had low SMP generally. The study attributed this to age, Gender, cultural beliefs, exchange rates and risk attitude. Furthermore, "the study concluded that there is no significant influence on financial literacy on stock market participation among university lecturers and recommends a high need for Dar es Salaam Stock Exchange (DSE) and Capital Market and Security Authority (CMSA) stakeholders to motivate and provide adequate awareness among university lecturers on potential benefits to invest in the stock market" (Anthony, 2020).

Zhou (2018) examined the degree to which great financial crisis affect SMP. The study highlighted the American households between 2007 and 2009 against their participation in the stock market and the major stock market depression in 2009. It concluded that based on low income, low financial literacy and segmented minority groups, these categories of households tend to withdraw their capital or stakes in the stock market at the announcement of a crash in

the stock market. It also compared its data of 2007 to 2009 with years 2003-2013 to conclude at a pre-crisis and post crisis evaluation. Conclusively, the study argued that heads of household who are minorities, households with little or no education and low-income households have high propensity rates to change their asset portfolio investments and change their risk behaviors that ultimately affect their wealth accumulation in the long run. furthermore, the study centered its work on the classic portfolio thesis as used by Markowitz (1952) that "assumes that individual investors' risk taking depends on investors' risk attitude and their estimates about the expected return and its variance and both return and risk expectations can vary substantially over time, as a result of macroeconomic events or individually experienced gains or losses" (Zhou, 2018).

Almenberga & Dreber (2012) in their study examined how gender and financial literacy influence stock market participation. Financial literacy was measured with the indices of risk attitude and interpretation of numerical questions as evidence of little or no financial literacy or financially literate individual. The results from their questions were matched against the number of women present in the sample and analyzed using ordinary least square (regression) method to conclude that women especially those who are low-income earners are less financially literate than men. The data collected also had a niche on first timers and individuals rather than households. This is slightly similar to what is undertaken in this study.

1.5. Hypotheses Development

The hypothesis for this study is analyzed and stated below:

H_{01}: There is no relationship between financial literacy and stock market participation

H_{02}: An individual's financial decision to participate in the stock market is not influenced by his nuclear household.

H_{01} attempts to address how much influence financial literacy has on SMP and how this affects individuals' financial decisions to invest, save or spend.

H_{02} attempts to address how much information shared in a nuclear household influences an individual's financial decisions and SMP.

2. DATA AND METHODOLOGY

2.1 Data

This study adopts a primary source of data collection through distributed (online) questionnaires in English and Estonian. The questions drawn are closed-ended questions for adequate analysis and directly linked to the research objectives of this study. With the use of survey questions (23) sub divided into three parts. The first set of five questions cover demographics of respondents (Part I), next ten questions showcase the respondents' knowledge on stock market (measures their literacy on basic financial calculations) (Part II) and last eight questions highlights individuals' attitude to invest from household influence, spending habits and risk tolerance (Part III). All respondents were contacted electronically via Facebook and in Estonia. A total of 240 respondents sent back responses.

2.2 Methods

Since it is believed that the process of research usually involves problem identification, constructing hypothetical statements, collecting relevant data, analyzing the data using the relevant and appropriate statistical tools of analysis. (Lara, 2017); this study uses quantitative method, specifically Excel is used for data recoding and descriptive analysis, Gretl is used for regression analysis.

Logistic regression allows researchers use binary values to determine a yes response as positive and no response as negative or zero. Odds ratio measures the association of exposure and outcome and helps to determine how an outcome with or without a set of exposures or exposure would turn out (Szumilas, 2010). We test both hypotheses simultaneously. In addition to financial literacy and nuclear, we control for age, gender, education, income level and risk (risk aversion). In total, we run five models with the following specification:

$$\mathbf{SMP_i = \alpha + \beta_1(\textit{hypotheses}) + \beta_2(\textit{socio} - \textit{demographics}) + \beta_3(\textit{preferences}) + \epsilon_i} \quad \textbf{(1)}$$

Where SMP$_i$ is stock market participation for individual i; Hypotheses is a vector of main explanatory variables of interest; Socio-demographics is a vector of socio-economic controls; Preferences is a vector that consists of a single variable, risk aversion.

Risk aversion values were measured based on respondents' willingness to invest in stocks generally. Their avoidance in stock investments is measured as respondents' provided answers to question 17 preferring to invest in others order than stocks, respondents investing "10%" or "none" of gifted money (Question 20) and "very high risk" answers for question 21.

HSH is measured as an individual's decision to invest based on nuclear household influence. Question 15 and 19 is regressed as family members (nuclear) having stocks and respondents' willingness to tur to their family for advice on stocks investment against other options.

2.3 Descriptive Statistics

Tables 2 and Figure 1 show the spread of respondents' demographics from gender, age, employment status, education to income earned (details in appendix two). The total number of respondents answered survey questions and analysis of their questions are given in the next subsection.

Table 2: Respondents Data.

		<18	18-25	26-33	34-41	42-49	50-57	58-65	66 and above	Total
Gender	Female	3	33	20	2	14	10	10	5	97
	Male	17	27	28	22	19	12	11	7	143
Respondents										240

Source: author

Figure 1: Demographic Distribution and Frequency
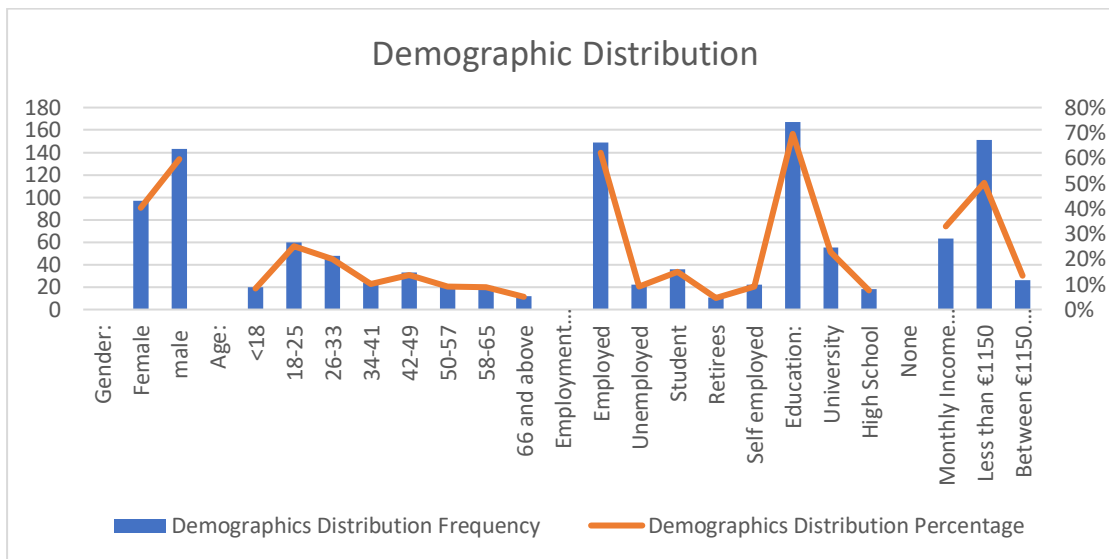
Source: author's calculations

Demographics have been categorized as shown in figure 1 based on age, gender, education, income level and employment. Each of these demographics are static and cannot change. Whether or not they are regressed and are significant or insignificant, it is impossible to change theoretically and it is assumed for this study that each of these changes and influence an individual's investment decision to have stocks or participate in the stock market. The highest qualification of the sample is one or more university degree, highest age group is 18-25, most earned age group is €1150-2,000 and 62% of the sample are employed.

Appendix three shows all questions used for this study via aforementioned mediums. These questions were asked from simple to basic financial/numeration questions in order to ascertain the respondents' financial literacy. Additionally, questions on risk, risk tolerance levels and household influence on stock market purchases/participation were also measured.

Table 3. shows the spread of respondents who answered financial literacy questions correct and their age groups. The correct answers stand at scale 7-10 while incorrect is lower including "none" or "not sure" or "I don't know". The highest percentage of the sample who were not sure of the answers filled "none" or "not sure" or "I don't know" in their questionnaires to questions 7 to 14 of Part II of the questions used to measure the financial literacy of the sample. Based on the results, about 58% of correct answers to Financial literacy questions were females and 42% were males (Appendix Three). The highest number of correct answers are within age group 18-25, 26-33, 34-41, 42-49. These are the average age groups currently part of the

highest of Estonia's labor force. This means that the sample for this study is particularly semi-literate and high literates as this has the highest numbers. Thus, it is important that individuals are financially literate and sound in the knowledge of trading, investing, and saving for a better economy.

Table 3: Respondents' answers to FL

Total Number of Respondents		Percentages
Correct	139	57.92%
Incorrect	48	20.87%
Not sure/none/I don't know	53	56.39%
	240	

Source: author's calculations

Part III of the survey questions was divided into (subsections) questions for household and others for risk attitudes (Appendix three). For survey questions relating to household, Table 4 depicts the number of respondents who would seek financial advice from colleagues, family and friends, stockbrokers, or internet. The purpose for the focus on this question is because it is the subject of the second hypothesis of this study, and this explains that the sample of this population have their financial information from their nuclear households and next is the colleague category who more or less have close relationships with them. This shows that the 'word of mouth' for stock market participation is important as experiences from friends, family and colleagues have great influences on the numbers of stock market participants. The more success stories (or not) told by nuclear household members share amongst themselves the more eager other members of the household may be willing to follow suit despite other hindering factors like risk, income level, etc. Also, this study agrees that some family members also acquire basic financial knowledge or educational knowledge on finance and trading and so may willingly educate or pass down their knowledge to other members of their family. Some of the respondents who chose 'none' have written back and acknowledge their reasons and blamed it on their inability to choose family members because they do not have parents or responsible family members who may or may not encourage their financial skills in the long run. other hidden factors such as background, parenting or cultural beliefs were exempted as factors that may affect SMP from the perspective of households because of the difficulty in measuring them. Conclusively, family households have huge numbers registering to the fact that their spread of 'word' on trading trends and breakdown of stock market complexities are made

simple and free of charge. The table below shows the definition of relationships for this study's sample.

Table 4: Respondents category for household influence

Categories	Relationship
Sibling	Nuclear
Cousin	Extended
Grandparents	Extended
Parent	Nuclear
None	

Source: author

Other survey questions as shown in Appendix three are from question 17, 18, 20 and 21. These highlighted investment attitude, risk appetite and income levels. These posed reasons why individuals may be reluctant to participate in the stock market. Question 18 and 20 highlighted how much stakes may be invested in stock markets if they had received monetary gifts, their knowledge on the risk measurement of the stock market and their risk appetite. Details can be seen below.

Table 5: SMP based on risk appetite and Investment attitude

Total Number of Respondents			Percentages					
Risk averse		156	65.00%					
Risk neutral		51	21.25%					
Risk taker		33	13.75%					
		240						
Income Level (€)	Less than 1150	%	Between 1150 and 2000	%	Greater than 2000	%		
Risk averse	37	23.7%	100	64.1%	19	12.2%		
Risk neutral	10	19.6%	13	25.5%	28	54.9%		
Risk taker	17	51.5%	11	33.3%	5	15.2%		
Risk Appetite	<18 years	18-25	26-33	34-41	42-49	50-57	58-65	>66
Risk averse	19	22	12	19	23	28	11	22
Risk neutral	1	8	7	8	1	6	10	10
Risk taker	11	9	6	5	1	0	0	1
Investment attitude	<18 years	18-25	26-33	34-41	42-49	50-57	58-65	>66
Agree	15%	60%	77%	22%	17%	57%	55%	22%
Disagree	33%	11%	9%	53%	18%	19%	22%	37%
Indifferent	33%	9%	4%	21%	33%	11%	22%	22%
None	19%	20%	10%	4%	32%	13%	1%	19%

Source: author's calculations

For this study, a risk averse individual is someone who detests risks and avoids it; risk neutral is someone who only take calculated risks and has relief stakes in other investments should the

actual investment sink and they invariably take risk and avoid at changing intervals; risk takers are individuals who take risks because of attracted high profits. They may however, be unknowledgeable about financing, trading, savings or investments.

The table also presents a total number of respondents who are risk averse based on income earned. 37 respondents who earn below €1150 are 37 respondents out of 156 respondents in total that are risk averse (results: 23.7%). Similarly, 11 respondents out of a total of 51 respondents who are risk-neutral earn between €1150 and €2000 (results: 21.6%), and the age group category describe the age of respondents who are risk-averse, risk-neutral, and risk-takers. The investment category represents the percentages shared amongst age groups that agree, disagree, indifferent or none retrieved from question 8 (Appendix three): *What do you think of the statement below: It is better to keep money in a savings account than investing in stock because of the risk?*

The stock market is an 'economic barometer' that provides security pricing, fosters economic growth, balances equity, creates an environment for financial speculations, liquidity, and most importantly, a platform for capital allocation (David, 2021; Grohmann, Theres, & Lukas, 2018). It is also characterized by purchase and sale of long-, medium- and long-term securities, financial indicators for FOREX, gains and losses, diversification of investments and asset portfolios, 'bulls and bears, boom and doom and most importantly, high volatility or risk. Because of the characteristics of stocks/shares/equity, this was highlighted in the study. Although, other medium to low risks investments are in the stock market like government securities, etc.

The risk tolerance is assumed for this study to be one of the major reasons for low SMP in addition (or an influencing factor) to financial literacy. This means that some individuals can be financially literate and be risk averse, some can be semi-financially literate and be risk takers or no financial literacy and be risk neutral. According to David (2021), highly literate individuals are expected to be risk neutral because of their knowledge, they only take calculated risks. Table 5 shows the number of respondents with different age categories and income levels. For example, the income levels matched against risk tolerance/appetite show that at less than €1150 at 88.1% risk averse and are not willing to take risk in the stock market. This can be assumed that their earning capacity do not meet up to their needs or simply because they believe investing in the stock market is not worthwhile. The highest risk takers earn below €1150 and still prefer to invest a huge chunk of their income. Highest risk neutral respondents based on

results have income levels at >€2,000. This may be attributable to their financial literacy, years of experience (good/bad financial decisions) and age with less income to trade with.

Questions 17, 18, 20 focuses on respondents' investment attitude to SMP and their relative knowledge on savings and investments. Respondents answered that they would prefer to put their inheritance in a savings account or pay off existing debts rather than invest in a stock market or invest in mortgage. This showed that their risk appetites have strong influences on their investment decisions along with financial literacy.

Finally, respondents' attitude to savings and investment influenced by their environment (Appendix Three). The question's focus on "What do you think of the statement: 'It is better to keep money in a savings account than invest in a stock market because of risk'?" Unfortunately, the active age group with the most active years and should be interested in saving or investing in their future by taking sound decisions and calculated risks. Although stocks are highly volatile, the right investments and knowledge and perfect market situations (realistic imperfect) can allow substantial amounts grow over time. The highest disagreed age group is above 50 years and surprisingly respondents below 18years. This shows that investment decisions of the sample taken for this study represents a fraction of many other individuals who do not plan to have savings or invest in the stock market for future financial stability. Savings in the bank is a step in the right direction but open to withdrawals to meet a need at any time and a convenience unlike a stock market that truly portrays a good savings culture when right financial decisions are made, and withdrawals not easily made like a savings account.

3. EMPIRICAL RESULTS

Regression results are presented in Table 6. The total number of observations for this study is 240. The results show odds ratios, standard error, and asterisks that signify p-values.

Where the SMP is expected to change as FL, Age, education, income, nuclear (HSH), RAV and employment are run together. In order to see these changes, the independent variables (demography) are controlled while the key variables of interest FL, HSH and Nuclear variables are added. The demographics of employment, age, education, and income level are not easily changed and so are extremely important in the data set.

In Table 6. FL variable is significant all through the models except for model 4 and 5 changing as each variable for income, employment status, and risk are added. It was also not significant in model 5 when Nuclear was removed. Significance at all levels is important but the odds of an individual's financial literacy influencing his decisions to participate in the stock market from the data set is high. When matched against 1, FL in model 1 produces 6.25 times (525%), 4.97 times (397%), 2.15 times (115%), 1.75 times (75%), 1.87 times (87%). This means that if FL is greater than one unit, then the likelihood of an individual having stocks is 6.25 times through to model 5 at 1.87 times higher.

HSH (nuclear) represents the members of an individual's household who hold stocks (1 for yes, 0 for no). FL was added to see the change in the variable HSH and analyze if HSH may be significant or have positive association with SMP. FL remains statistically significant in this dataset.

Household (Nuclear) influence on SMP has a statistically significant value in both model 3, and 4. Additionally, although nuclear produced significant values, its odds of having stocks based on family influences are lower. HSH is a useful variable but cannot be used to predict events at log odds in a larger population sample. This is because the focus of this research was based on the assumption that nuclear household influences an individual's SMP. These influences on an individual's decision can be both positive and negative. This cannot be

accepted based on negative coefficient values, that is, it decreases the number of participants rather than increase stock market participants within the households.

Additionally, from Table 6. since the number of cases correctly predicted in the data set is at 179, approximately 0.8 (74.6%), and closer to one rather than zero, the percentage of correct predictions shows a useful outcome or set of outcomes in real life situations.

Therefore, from Table 6. HSH having 35%, 40%, 60%, and 61% odds of the likelihood of individuals not having stocks based on household or nuclear influence is lower in model 1 to 4 against the dependent variable SMP.

Based on the findings above, the null hypothesis that: there is no relationship between financial literacy and stock market participation is rejected and alternative hypothesis is not rejected that there is a relationship between financial literacy and stock market participation. This is aligned with studies of Almenberga & Dreber (2012), Arts (2018) and David (2021).

The second null hypothesis is not rejected that: an individual's financial decision to participate in the stock market is not influenced by his nuclear household and the alternative hypothesis rejected that nuclear households have influences on the financial decisions of an individual that ultimately affects his stock market participation. This is also in accordance with literatures of David (2021), Thelsus (2010), Prietrui (2013).

The gender variable throughout the models 2 to 4 are statistically significant and agree with many research (Anthony, 2020; David, 2021; Grohmann, Theres, & Lukas, 2018). However, the models show that women are more likely to buy stocks than men. Against the odd of 1, despite the model being more populated by men, women are more likely to purchase stocks more than men according to this data set.

	MODEL 1			MODEL 2			MODEL 3			MODEL 4			MODEL 5		
	Odds	Std.Er.		Odds	Std.Er.		Odds	Std.Er.		Odds	Std.Er.		Odds	Std.Er.	
const	0.79	(0.24)		0.07	(0.80)	***	0.03	(1.30)	***	0.02	(1.35)	***	0.01	(1.26)	***
FL	6.35	(0.32)	***	4.97	(0.37)	***	2.15	(0.42)	*	1.75	(0.45)		1.87	(0.45)	
Nuclear	0.65	(0.30)		0.60	(0.45)		0.40	(0.56)	*	0.39	(0.57)	*			
Gender				0.37	(0.37)	***	0.28	(0.42)	***	0.30	(0.43)	***	0.32	(0.42)	***
Age 26-33				1.66	(0.47)		0.85	(0.64)		0.80	(0.66)		0.98	(0.64)	
Age 34-41				0.96	(0.70)		0.65	(0.80)		0.78	(0.82)		0.92	(0.82)	
Age 42-49				3.47	(1.27)		0.76	(1.34)		0.96	(1.37)		1.71	(1.32)	
Age 50-57				0.50	(0.95)		0.31	(1.03)		0.33	(1.09)		0.31	(1.10)	
Age 58-65				30.80	(1.19)	***	43.32	(1.54)	**	30.96	(1.45)	**	27.37	(1.45)	**
Age 66 >				0.74	(0.63)		0.22	(0.88)	*	0.26	(0.90)		0.60	(0.73)	
Edu1				28.90	(0.74)	***	70.40	(1.22)	***	93.97	(1.29)	***	81.37	(1.27)	***
Income 1150-2000							3.80	(0.53)	**	3.15	(0.55)	**	3.32	(0.55)	**
Income > 2000							582.94	(1.74)	***	590.02	(1.78)	***	417.45	(1.64)	***
Employed							1.25	(0.45)		1.16	(0.45)		1.08	(0.44)	
Risk										2.55	(0.55)	*	2.47	(0.54)	*
Adjusted R²	0.103			0.228			0.356			0.359			0.356		

Number of Observation 1-240

Table 6. Regression results

Note: Logistic regression. Dependent variable is stock market participation, which is a binary variable (1 means participation). FL is measured from questions 6 to 15, appendix three. Respondents who gave right answers on an average of 5 correct answers were given binary numbers 1 otherwise 0. Nuclear (HSH) was measured using respondents with families that had stocks and if they would seek financial advice from families. Respondents who had matching answers of yes with family and selected answers that their families had stocks represented 1. In the event the respondents chose 'no' to having families with stocks and seeking advice from family members, binary number 1 was used. In the event where there was a family member who had stocks and the respondent would seek advice from elsewhere order than family, the binary chosen was 0 (see appendix three). Risk averse is measured based (appendix three) on answers under category 'risk appetite and investment attitude'. Answers to putting money in stock is tagged as risk taker, mortgage investment as risk neutral and other responses and risk averse. For question 23, I agree answers are risk takers, indifferent is risk neutral and disagree is risk averse while answer 'I don't know' was dropped.

For age variable, Age was grouped as 18-25, 26-33, 34-41, 42-49, 50-57, 58-65 and >66 years. Age group 18-25 was dropped representing the lowest of the categories of the data set. From Table 6. age group 26-33 is insignificant throughout the models 2-5 but show in model 2 that there is the likelihood of having stocks at 66% though and a negative association with SMP from models 3 to 5. With odd ratios of the likelihood of having stocks at 15% lower in model 3, 20% lower in model 4 and 8% lower in model 5 (see Table 6). Similarly, 34-41 has 4% lower likelihood in model 2, 35% lower likelihood in model 3, 22% likelihood in model 4 and 71% likelihood higher in model 5. Age 42-49 shows higher likelihoods against odd ratios in model 2 at 241%, 24% lower in model 3, 4% lower in model 4 and 69% lower for the likelihood of owning stocks for age group 42-49. Ages 50-57 is only significant in model 5 with odd ratios 27.37 times higher (263.7%) and likelihood to invest in stocks. Ages 58-65 have higher likelihood values at 30.80 times, 43.32 times, 30.96times, 0.60 times lower in investing in stocks. They are all significant except in model 5. Ages above 66 is significant in model 3 and model 5 only. Matched against the odd ratios, 36% lower, 78% lower, 74% lower and 803.7% higher to purchasing stocks.

Interestingly, the model was regressed with Edu 1 and Edu 2. Edu 2 is high school degree but was dropped for Edu 1, one or more university degree. Edu 1 (Table 6) shows a statistically significant relationship at 5% p value. 28.90 times, 70.40 times, 93.97 times and 3.32 times for models 2 to 5. These show a positive odd ratio in model 2, 3, 4 and 5 and a higher likelihood of earned education of a university degree or higher is more than a high school certificate holder

Income level expressed as INL in the equation above is written as Incm1, Incm2 and Incm3 in regression results. Incm 1 is greater than €2000, Incm 2 is between €1150 and 2000 and Incm3 is less than €1150. Incm 3 is dropped while regressing because it is the lowest of the dataset. Therefore, Incm 2 produces a result that is statistically significant up until model 5 with odds of 56% lower to buy stocks. For model 3, 4 and 5 however, income variables €1150 to 2000 are highly significant all through models 1 to 5 and higher likelihoods of having stocks when compared to incm 3 and other variables being constant. Incm 1 greater than €2000 is statistically significant and higher likelihood values except in model 5 with 8% lower likelihood to invest in stocks.

Employment variable is also explored in this study and depicted as Emp 1 (employed), Emp 2 (student), Emp 3 (self-employed), Emp 4 (retired). For the regression Emp 2 (student) and Emp 4 (retired) are grouped as unemployed as it was assumed that if respondent is a student

and retired, they are unemployed while Emp 3 (self-employed) is grouped as employed. Statistical significance of employment variables is not visible but concentration of how these affect FL is important. Emp 1 is used as the focus of the research. This is true because the lowest of the variables which is unemployed is present in the dataset but not used. Therefore, according to model 3, 4 and 5, employed have 32%, 16% and 172% higher likelihoods to participate in the stock market by purchasing stocks.

P-values are used to test the statistically significant effects of each independent variable against the dependent variable. The statistically significant values at $p=0.05$, $p=0.01$, $p=0.1$ measured against the p-values provided (see Table 6), corr. (FL, SMP) is calculated. Therefore, at $p=0.1$, FL is statistically significant to independent variable SMP only in models 3 to 5.

All through the model, FL stood significant in models 1 to 3 and insignificant in models 4 and 5. However, there were higher likelihoods of 75% and 87% that a person who is financially literate is most likely to participate in stocks.

In order to further describe the association of SMP and FL, in relation to Arts (2018)'s study, a highly financial literate person does not necessarily mean the individual is risk neutral, risk averse or a risk taker. The risk averse variable described as RAV is employed in the regression to further describe FL's association with SMP. RAV is determined as the degree to which respondents preferred to invest in others rather than stocks. So those who picked options rather than stock is converted to binary number 0 otherwise 1. Although, other variables like education and employment were dropped, these produced results shown in Table 6. Employment and education variables were dropped because these are statuses accumulated overtime and may not necessarily change an individual's perception or attitude towards risk (Donkers, Melenberg, & Soest, 2001; Hartog, Ferrer-i-Carbonell, & Jonker, 2003; Wölfel & Guido, 2012).

From the results displayed in Table 6. RAV is statistically significant to SMP but changes FL, age, education, employment, and nuclear variables. RAV has high likelihood and positive association with SMP at 155%. However, RAV likelihood and positive association with SMP at 147% higher without the involvement of the HSH (Nuclear).

CONCLUSIONS

Despite unpredictability and absolute certainty for low SMP in countries of the world, traditional research has only focused on characteristics of an individual and less of his environment (socio-economic) of family influences. Although, the dataset showed a useful statistically insignificant value at 1% p-value for HSH, a larger data pool can be adopted for future research to further reintegrate the conclusions of this study.

The objective of the study is to first, examine the relationship between financial literacy and SMP and see if financial literacy is a degerming factor for SMP.

Secondly, to understand the dynamics of how important information from individuals in a nuclear household are able to encourage the statistics of participation in the stock market.

This study uniquely added a family's influence on an individual's financial decision (positive or negative) that affects the statistics of SMP in Estonia. Similarly, the FL of individuals is of importance if the SMP statistics are to be increased annually. The attractiveness of the stock market to a layman regardless of his income level, age, education, gender and employment status was highlighted in this study as having co-existing influences with financial literacy. Not much data has been extended to a country like Estonia and this has been accomplished by this study. All individual characteristics were niched to Estonia. Furthermore, 'stock market participation is dependent on the cost of entry and for individuals being financially illiterate, the stock market entry and participation costs are higher' because they have more stakes if the odds are against them.

Therefore, this study has highlighted key things that shows risk aversion has a positive association with financial literacy and SMP and the importance of this is determined not solely on FL but an addition that risk aversion is not relatable with education, gender and employment but income, age and FL. Stock market participation in countries of the world increase the circulation of wealth, balance of income and from a great perspective balances excess supply of money but strongly subject to individual's willingness to buy stocks.

One of the limitations of the study is that it is restricted to individuals on some online platforms such as Facebook groups, in English and Estonian language, as questionnaires was distributed via this medium and does not cover for individuals who do not use this platform or speak any of the two languages. Also, there is the possibility of bias from respondents.

Furthermore, it does not guarantee that individuals outside Estonia did not respond to the question.

For further study, a more detailed research should be done to determine at what level of education can one be said to have attained financial literacy and be willing to hold stocks. as this study only put from a university degree and above into consideration hence the result is only for a sample of education and would require further investigations.

This study has provided empirical results on the influence financial literacy has on stock market participation and how much information shared by family members of a particular household affects or influences the financial decisions of those within the household in the stock market. Although, several factors also influence financial literacy as aforementioned and identified in the analysis, the ultimate responsibilities however rest on the ability of the government to further cushion the need for financial education on all levels either with some level of education or not and how much word of mouth within households also determine or decrease/increase SMP. Ultimately, the benefits of this as mentioned in the previous chapters outweigh the risks. The stock market is an essential part of the financial system and should be orchestrated in driving more individuals to investing in it.

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APPENDICES

Appendix 1. (SMP in Europe)

Retrieved from (Arts, 2018, p. 3)

Stock market participation rate per European country. This figure provides an overview of the stock market participation as fraction of the population per country. Stock market participation consist of both direct and indirect stockholdings. Numbers are derived from Wave 6 of the Survey of Health, Ageing and Retirement in Europe (SHARE) database.
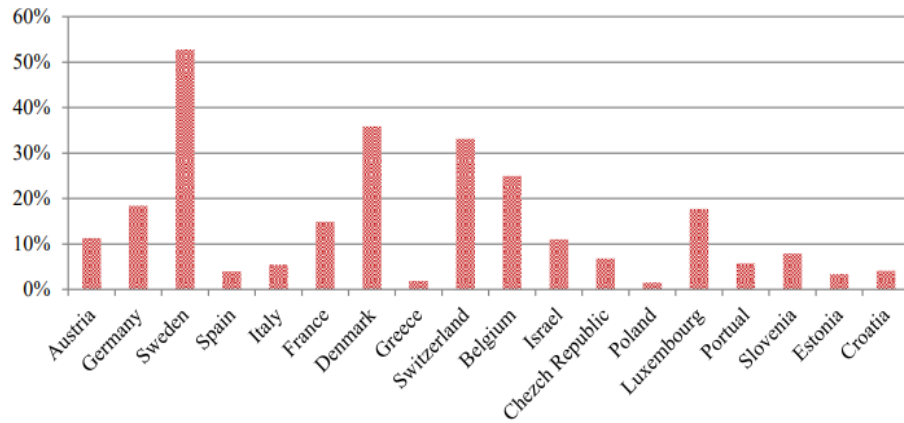
Appendix 2. (Descriptive statistics)

Demographics Distribution		
Variables	Frequency	Percentage
Gender:		
Female	97	40.42%
male	143	59.58%
Age:		
<18	20	8%
18-25	60	25%
26-33	48	20%
34-41	24	10%
42-49	33	13.75%
50-57	22	9.17%
58-65	21	8.75%
66 and above	12	5.00%
Employment Status		
Employed	149	62.08%
Unemployed	22	9.17%
Student	36	15.00%
Retirees	11	4.58%
Self employed	22	9.17%
Education:	167	69.58%
University	55	22.92%
High School	18	7.50%
Monthly Income Level	63	32.89%
Less than €1150	151	50.17%
Between €1150 and €2000	26	13.29%
Greater than €2000		

Table 7: Respondents data for Questions on Financial Literacy

Appendix 2. Descriptive statistics (continued)

FL Correct	Male	Female
<18 years	9	7
18-25	12	19
26-33	23	22
34-41	23	17
42-49	12	9
50-57	4	9
57-65	9	4
>66	3	5
Total	31	22
	52.50%	47.50%
	240	

Table 8: FL Respondents correct and Incorrect answers in %

Appendix 3. (Questionnaire)

		Questions for Demography Data	
S/N	Question	Description	Measurement
1	Please select your Gender	Gender selection	Male or Female
2	Please select your age group	Statement of Age	Respondents choose between: <18; 18 to 25; 26 to 50; >50
3	What is your average monthly income?	This was used to determine their income bracket	Respondents choose between: <€584; €584 to 1,000, €1,000 to €1,584 and >€1,584
4	Please select your highest level of education	This was used to determine their level of education	Respondents choose between higher university education/high school/none
5	How would you describe your current employment status	This was used to determine employment status of respondents	Employed/unemployed/student/self employed
		Financial Literacy Questions	
S/N	Question	Description	Measurement
6	Do you have stocks in your name?	This is to determine their current participation in the stock market	Yes or No
7	Which of the following best describes how fast the stock market moves up and down	This is to test the knowledge of respondents' understanding of the stock market	Respondents choose from Market order/market volatility/market liquidity/I am unsure
8	Which of the following best describes a market where prices are expected to rise	Basic financial literacy question	Bear market/bull market/black market/stag market/ not sure
9	Which of the following best describes a market where prices are expected to fall	Basic financial literacy question	Bear market/bull market/black market/stag market/ I'm not sure
10	Which of the following will give you the highest return on 10,000 Euro	Basic financial literacy question	Bonds/savings account/stocks/I don't know
11	If interest rate falls, what do you think happens to stock prices	Basic financial literacy question	They fall/they rise/they remain unchanged/I don't know
12	If an individual spreads his investment by buying different stocks and invests in mutual funds, what happens to his money?	Basic financial literacy question	It increases/ reduces/remains unchanged/I don't know
13	If you had 100 Euro in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?	Numeration Question	More than €102/Less than €102/Exactly €102/ I don't know
14	If you leave 1,000 Euro in your savings account for 5 years at an interest rate of 20% per year, how much will you have at the end of five years?	Numeration Question	More than €2,000/Less than €2,000/Exactly €2,000/ I don't know
15	How would you rate your financial knowledge on a scale of 1 to 10? With 1 being very poor and 10 for expert	Describing the respondents	10,9 and 8 as high literacy And 7 to 0 as low literacy

Appendix 3. (Questionnaire continued)

	Questions for Individuals' decisions to investment based on Households/Risk appetite		
S/N	**Question**	**Description**	**Measurement**
16	Which member of your family has stock/shares?	Respondent's attitude to savings and investments influenced by their environment	sibling/parents/cousin/none
17	Who are you most likely to turn to for financial advice?	Respondent's attitude to savings and investments influenced by their environment	Family and friends/colleague/stockbroker/the internet/none of the above
	Risk appetite/tolerance		
18	If you receive 10,000 Euro as a gift, what percentage of it will you be willing to put in the stock market?	Respondent's attitude to savings and investments influenced by their environment	10%/ 25%/ 50%/ 100%/ none
19	How would you rate the risk involved with buying stocks?	This attempts to understand their risk perception of the stock market	High risk/medium risk/low risk/I don't know
20	If you inherit 10,000 Euro today, which of the following are you likely to do first?	Respondent's attitude to savings and investments influenced by their environment	Put it in a savings account/Pay off existing debts/invest in mortgage/Invest in stock and shares
21	Do you think investing money in a retirement plan at any age is a good thing for future financial stability?	Tests their knowledge on investment and savings	Yes or No
22	If an individual spreads his investment by buying different stocks and invests in mutual funds, what happens to his money?	Investment reasoning	It increases/reduces/remains unchanged/I don't know
23	What do you think of the statement below: "It is better to keep money in a savings account than invest in a stock market because of the risk"?	Respondent's attitude to savings and investments influenced by their environment	I agree/disagree/indifferent/I don't know

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