UNIVERSITY OF LJUBLJANA SCHOOL OF ECONOMICS AND BUSINESS

MASTER'S THESIS

FINANCIAL LITERACY AND RETIREMENT PLANNING IN THE REPUBLIC OF NORTH MACEDONIA

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LIST OF ABBREVIATIONS

- **CEA** Centre for Economic Analysis
- EU European Union
- $\ensuremath{\mathbf{GFK}}$ Growth for knowledge
- **OECD** Organisation for Economic Co-operation and Development
- **UNESCO** United Nations Educational, Scientific and Cultural Organization
- USA United States of America

INTRODUCTION

The first documented written language emerged in Mesopotamia between the year 6000 B.C. and 5700 B.C. It is likely that since then, written language and literacy have been one of the main building blocks for the development of the modern society. UNESCO has given few different definitions on literacy. The first is a simple definition, where literacy is defined as the ability to write and read simple sentences. This definition has been developed further to the latest, more comprehensive definition published in 2005, where literacy is defined as the ability to identify, understand, interpret, create, communicate, and compute, using printed and written materials associated with various contexts. In addition, literacy helps individuals to expand their knowledge enabling them to achieve their goals and realize their potential as a fully functioning member of society (UNESCO, 2017).

In this modern society, people are making more and more decisions daily that have impact on their financial wellbeing. Even small decisions can have negative effect on the financial well-being on the long run if a person making those decisions makes a mistake due to misinformation or lack of knowledge (Lynch, 2011). And the most important financial decisions that an average person makes in his lifetime, financing the purchase of a home and saving, investing, and planning for retirement, can have a severe impact on the aforementioned well-being (Hung, Parker & Yoong, 2011).

Many authors believe that in order to make a good decision regarding these important aspects in life, another type of literacy, financial literacy, is necessary. Similar to defining literacy, where the UNESCO definition is only one of many, there is no consensus on the definition of financial literacy as well. Hung, Parker & Yoong (2011, p. 12) offer a definition of financial literacy that builds on previous research: "Financial literacy is knowledge of basic economic and financial concepts, as well as the ability to use that knowledge and other financial skills to manage financial resources effectively for a lifetime of financial well-being."

The importance of financial literacy is shown in many studies, for example, Hung, Parker & Yoong (2011, p. 22) show with their research that people with low financial literacy are less likely to make proper decisions and save for retirement. They also have higher debt and tend to save less from their monthly income (Stango & Zinman, 2013) and they tend to pay higher interest rates on their loans and bear higher transaction costs (Lusardi & Tufano, 2015). In their research, Behrman, Mitchell, Soo & Bravo (2012, p. 303) show that financial literacy is more important than schooling when it comes to wealth accumulation and investing for retirement. This impact is significant enough that an investment in increasing the financial literacy can yield a significant return.

While studies confirm that financial literacy is important, research conducted in measuring it around the world shows that the global level of financial literacy is low. In a survey of G20 countries conducted by OECD, people had an average score of 12.7 out of a maximum

of 21 points or just over 60% (OECD, 2017). In a paper, Klapper, Lusardi & Oudheusden (2017) analyse the results of the survey conducted by Standard & Poor's rating services. They concluded that just one in three people on average is financially literate.

In the Republic of North Macedonia, almost 30% of households have difficulty either buying food (12.4%) or are able to buy food but have difficulty buying clothes (17.2%). A significant proportion of households, 44.2%, are unable to save regularly as their income is only sufficient to cover their expenses. An alarming 66.2% have stated that they either have no savings at all (31.1%) or that in a case where they would lose all household income, their savings would last for one month or less (25.1%) (The alternative financial services association of North Macedonia, 2019).

Previous research shows that financial literacy in the Republic of North Macedonia is lower than in the rest of the countries in the region. In the above-mentioned study conducted by Standard & Poor's rating services, the Republic of North Macedonia has 21% of adults who are financially literate. In comparison, Slovenia has 44% financially literate adults, Serbia has 38%, Montenegro has 48%, Bulgaria has 35%, Croatia has 44%, Greece has 45% and Albania has 14% (Klapper, Lusardi & Oudheusden, 2017). In another research, conducted by Growth for Knowledge (GFK), a company specialized in research, on behalf of the National Bank of the Republic of North Macedonia following OECD methodology, the results are similar. Financial literacy among citizens in the Republic of North Macedonia is lower than in all countries in the region, including Albania and well below the average of G20 countries (GFK, 2018; OECD, 2017).

Considering that data in other countries have shown that financially literate people are more likely to save and plan for retirement I decided to test whether this hypothesis is also valid in the Republic of North Macedonia.

The main objective of this research is to assess the level of financial literacy among the people living in the Republic of Macedonia and analyse how they compare to countries where similar research has been conducted. In addition, the research aims to analyse whether financial literacy has an impact on how people plan for their retirement and how prepared they are when they reach this stage of life.

The research questions of my master thesis are:

- How financially literate are citizens of the Republic of North Macedonia?

- How (if at all) financial literacy affects the retirement planning in the Republic of North Macedonia?

In the first section of my thesis, I provide more detailed information on the two main concepts, financial literacy and retirement planning. I review the literature and examine the relationship between the two. This helps me show why financial literacy is important and

the impact it has on retirement planning. In addition, I examine the methods used to measure financial literacy and past data from measurements around the world. In the second section, I provide a brief overview of the macroeconomic situation in North Macedonia. I also explain the country's pension system and the savings and investment culture of the population. I also provide an overview of previous measures of financial literacy in the country. In the third section, I explain the data collection methodology and analyse the sample. In the fourth section, I measure financial literacy in the country using the data collected. I then create indices of financial literacy based on the measurements. I use these indices in a multivariate analysis to assess whether the level of financial literacy has an impact on the population's retirement planning. Finally, I discuss the results from the survey and my measurements.

1 LITERATURE REVIEW

1.1 Retirement planning

Retirement planning is very important if one wishes to have a peaceful and stable retirement, but still many people fail to plan for retirement and retire with significantly less wealth and assets than those who do (Lusardi & Mitchell, 2011b, p. 523). A lot of the people lack the necessary knowledge or training to be able to make the right decisions and without help they make naive mistakes, especially in their asset allocation (Thaler & Benartzi, 2007, p. 23). Furthermore, Benartzi & Thaler (2001, pp. 96-97) discover that when people choose among different options to invest their wealth for retirement, they allocate it equally among all options. Depending on the options available, people may end up with a portfolio that is too conservative (mostly fixed income) or too risky (mostly equity). Many people fail to estimate how much money they would need after retirement, leading them in serious financial trouble after retirement (Lusardi & Mitchell, 2010, pp. 16-17).

Another factor to account for when planning for retirement is debt as it has a significant impact on the financial well-being in retirement. Lusardi, Mitchell & Oggero (2018, pp. 24-25) conclude that people nearing retirement are more in debt today compared to the past, whether it is due to poor decisions or buying homes with higher prices. This also increases the likelihood of financial problems in retirement.

McKenzie & Liersch (2011, p. 10) show in their research that people fail to estimate the effect of the compound growth. When asked to provide an estimate of the amount saved by monthly saving instalments over a long period of time with compound interest, the median estimate was 90% lower than the correct value. Because of this they do not realize the benefits of starting to save sooner than later. They found out that the lack of awareness has a negative effect on the incentive of people to start saving earlier and that educating people might give them the push they need.

Finally, many people fail to make changes to their retirement asset allocation. Thaler & Sunstein (2008, pp. 34-35) in an explanation of the status quo bias refer to an example that more than 50% of the college professors have made zero changes to their asset allocation. Obviously, this is not ideal, since as one approaches retirement, it would be prudent to reduce exposure to more volatile assets, such as stocks, thereby reducing the overall risk.

1.2 **Defining financial literacy**

Financial literacy is a relatively new concept. According to an estimate by Beal & Delpachitra (2003) it has been around since the early 1990s. Thus, as mentioned before, there is no unified definition for it. In fact, Huston (2010, p. 296) argues that not only is there no universally accepted definition for financial literacy, but that the term is often used interchangeably with financial education and financial knowledge.

According to Lee (2012) the first mention of the term and also, the first definition comes from a report by Noctor, Stoney & Stradling (1992) written for the National Foundation for Educational Research commissioned by NatWest Bank. Google Ngram Viewer (Google, n.d.), a search engine that can track mentions of a particular word or phrase in published books and articles over time, supports this claim. On Figure 1 we can clearly see the beginning of the use of the term "financial literacy" in the early 1990s and then we can notice three sharp increases. The first, after the dot-com bubble, at the beginning of the new millennium, the next one after the Global financial crisis in 2007-08 and the most recent one in the past couple of years.



Figure 1: Usage of the term financial literacy over time (frequency in 1 million words)

Source: Google Ngram viewer (n.d.).

There have been several financial crises, people have walked on the moon multiple times, the internet was created, and many other scientific achievements before we started discussing the financial literacy and the necessity for improving it. Therefore, as mentioned earlier, many authors have given a definition of the concept according to their understanding and beliefs.

In a comprehensive study on measuring financial literacy, Huston (2010) singles out eight definitions of financial literacy. The definition provided by Noctor, Stoney & Stradling (1992) is chronologically the first, adding merit to Lee's (2012) claim that this is in fact the first attempt to define the term financial literacy. The definition provided by Noctor, Stoney & Stradling (1992, p. 4) for financial literacy is the following: "The ability to make informed judgements and to take effective decisions regarding the use and management of money". Beal & Delpachitra (2003, p. 65) accept this definition in their research conducted to assess the financial literacy among Australian university students.

Source	Definition		
Noctor, Stoney & Stradling (1992)	"The ability to make informed judgements		
	and to take effective decisions regarding the		
	use and management of money" (p. 4)		
Mason & Wilson, (2000)	"An individual's ability to obtain,		
	understand and evaluate the relevant		
	information necessary to make decisions		
	with an awareness of the likely financial		
	consequences" (p. 31)		
Vitt et al. (2000)	"Personal financial literacy is the ability to		
	read, analyse, manage, and communicate		
	about the personal financial conditions that		
	affect material well-being. It includes the		
	ability to discern financial choices, discuss		
	money and financial issues without (or		
	despite) discomfort, plan for the future, and		
	affect events day financial desigions		
	including events in the general economy"		
	(p, 2)		
Hilgert Hogerth & Beverly (2003)	(p. 2) Financial knowledge		
Moore (2003)	"Individuals are considered financially		
Woore (2003)	literate if they are competent and can		
	demonstrate they have used knowledge they		
	have learned. Financial literacy cannot be		
	measured directly so proxies must be used.		
	Literacy is obtained through practical		
	experience and active integration of		
	knowledge. As people become more		
	literate, they become increasingly more		
	financially sophisticated and it is		
	conjectured that this may also mean that an		
	individual may be more competent." (p. 29)		

Table 1: Conceptual definitions of financial literacy

(table continues)

(continued)						
Source	Definition					
National Council on Economic Education (2005)	"Familiarity with basic economic principles, knowledge about the U.S.					
	economy, and understanding of some key economic terms" (p. 3)					
Mandell (2007)	"The ability to evaluate the new and					
	complex financial instruments and make					
	informed judgments in both choices of					
	instruments and extent of use that would be					
	in their own best long-run interests" (p. 163- 164)					
ANZ Bank, (2008), drawn from Schagen	"The ability to make informed judgements					
(1997)	and to take effective decisions regarding the					
	use and management of money." (p. 1)					
President's Advisory Council on Financial	"The ability to use knowledge and skills to					
Literacy (2008)	manage financial resources effectively for a					
L	lifetime of financial well-being." (p. 37)					
Lusardi (2008; 2011)	"Knowledge of basic financial concepts,					
	such as the working of interest					
	nominal and real values and the basics of					
	risk diversification "(n, 2)					
Remund (2010)	"Financial literacy is a measure of the					
	degree to which one understands key					
	financial concepts and possesses the ability					
	and confidence to manage personal finances					
	through appropriate, short-term decision-					
	making and sound, long-range financial					
	planning, while mindful of life events and					
	changing economic conditions." (p. 284)					
Atkinson & Messy (2011)	"Financial literacy is a combination of					
	awareness, knowledge, skill, attitude and					
	benaviour necessary to make sound					
	individual financial well-being"					
Lusardi & Tufano (2015)	"The ability to make simple decisions					
	regarding debt contracts. in particular how					
	one applies basic knowledge about interest					
	compounding, measured in the context of					
	everyday financial choices" (p.1) - this					
	definition is focused on debt literacy.					

Source: Hung, Parker & Yoong (2011); Pokrikyan (2016); Huston (2010).

While this definition is more focused on personal finances and managing personal finances, Mason and Wilson (2000, p. 31) have a different focus and define financial literacy as the ability to gather and understand relevant information necessary to make a decision and awareness of the possible outcomes arising from it. As we can see in Table 1, Hilgert, Hogarth & Beverly (2003) give the most basic definition of financial literacy, making no distinction between financial literacy and financial knowledge. The National Council on Economic Education (2005) and Lusardi (2008; 2011), also in a way define financial literacy as financial knowledge, or familiarity with the economy and understanding of basic economic principles. Other definitions become more complex and in addition to knowledge, to be financially literate a person must be able to make sound short-term decisions, while keeping the bigger picture, or long-term planning in mind (Atkinson & Messy, 2011; Remund, 2010). A financially literate person has to understand and make the correct choices regarding personal debt (Lusardi & Tufano, 2015). Most complex, or most demanding are those that require a person to be able to use, or have already used, their knowledge and skills to make appropriate decisions when faced with complex financial instruments (ANZ Bank, 2008; Mandell, 2007; Moore, 2003; President's Advisory Council on Financial Literacy, 2008).

In addition to the definitions mentioned so far, Huston (2010, p. 307) provides a very comprehensive definition of financial literacy, which is visualised in Figure 2. She agrees that financial knowledge is an integral part, or the building block towards financial literacy, however the two concepts are not equal. In addition to knowledge, a financially literate person must have the ability to apply knowledge in practise and make calculated decisions which will positively impact his/her financial well-being.





Source: Huston (2010, p. 307).

Hung, Parker & Yoong (2011, p. 10) combine the abovementioned definitions into one, their definition is as follows: "knowledge of basic economic and financial concepts, as well as the ability to use that knowledge and other financial skills to manage financial resources effectively for a lifetime of financial well-being."

1.3 The importance of financial literacy

In many aspects, financial literacy is important and necessary (Mandell, 2011 p. 2; Mason & Wilson, 2000 p. 34),

People born between 1980 and 1990 are now between 30 and 40 years old and have lived through not one, but three "once in a lifetime" financial crisis (dot com bubble, financial crisis of 2007-08, COVID-19 recession). Recent developments in the stock market such as the "war" between reddit traders and Wall Street (Platt & Smith, 2021) in the heavily shorted stocks resemble the "Pump & Dump" strategy, that was popular in the dot com bubble (Armstrong, 2021). These events are not likely to lead us into a new financial crisis just yet, but the generation mentioned above will most likely live through another one of the "once in a lifetime" crisis. Klapper, Lusardi & Panos (2012, pp. 28-29) in a research of the effects of financial literacy on decision making conclude that people with higher level of financial literacy tend to have more savings and are better prepared to deal with financial crisis. Bucher-Koenen & Ziegelmeyer (2012), investigated whether financial literacy has an impact on the amount of capital losses during financial crisis. Even though they found no evidence that the financially illiterate people lose more capital, they found out that they are more likely to sell when markets are down. van Rooij, Lusardi & Alessie (2011a, p. 465) show that higher levels of education and wealth increase the likelihood of stock ownership, as does age. This makes sense as older and more educated people have more disposable income to put into savings. They also point out that financial literacy has an impact on the likelihood of stock ownership. And this statement held through even after controlling for disposable income and other demographic characteristics. Mouna & Jarboui (2015 pp. 816-817) in a study of the Tunisian market provide sufficient evidence that financial literacy matters when it comes to portfolio diversification. Individuals with higher financial literacy had more diversified portfolios, this was also true for individuals who have been participating or investing in the stock market for a longer period of time. On the other hand, Awais, Laber, Rasheed & Khursheed (2016, p. 77) argue that people with higher financial literacy are less risk averse and seek investments with higher expected returns.

All this leads to the conclusion that financial literacy is indeed important both in terms of investing in the stock market and in dealing with financial crisis. Mandell (2011 pp. 2-3) even believes that a lack of financial literacy may have a negative impact on the stock market. For example, investors showing irrational behaviour. If we go back to a very recent example mentioned above, the Reddit – Wall Street "war", we can observe such irrational behaviour. "Redditors" proudly post that they invest their entire life savings in just one

company and interestingly enough, they refuse to sell the shares even if they lose more than 50% of their investment in one day. Many of them had no investments before. We can describe this with the term "irrational exuberance". The former chairman of FED first used the term to describe market anomalies during a time of very high liquidity, similar to what we have now (Duru, 2013 p. 45).

Financial literacy is not only important when the stock market is in question. Cumurovic & Hyll (2016, p. 17) conclude that it has a positive impact on self-employment, due to number of reasons, better understanding of risk and other financial concepts, and higher efficiency. In his research, Kojo Oseifuah (2010, p. 177) concludes that young entrepreneurs have an above average level of financial literacy. Shen, Lin, Tang & Hsiao (2016, pp. 61-62) conclude that financially literate people are less likely to have a financial dispute. When they do have, they are more eager to resolve the issue faster and peacefully rather than resorting to violence.

1.4 Measuring financial literacy

As we have already noted, many authors have expressed their opinions on the definition of financial literacy, ranging from equating it with financial knowledge to understanding complex financial instruments and making appropriate decisions. Until a single definition becomes accepted in the academic community, we will not have a single measure of financial literacy. For example, if everyone had their own definition of how long a meter is, it would be wrong to compare distances given by two different observers. If we extend the comparison, given that countries around the world still use different measurement systems, it is unlikely that we will reach a single definition of financial literacy. However, this does not mean that we cannot try to measure it, and so far, there are several surveys that aim to measure financial literacy.

Hung, Parker & Yoong (2011) conducted a survey on the existing methods to measure financial literacy. They identified 16 different strategies for measuring financial literacy, which are shown in Figure 3. The number of questions in these surveys varies from 3 questions, the fewest, up to 36 questions. Mostly binary and multiple-choice questions are used in all of the surveys. To determine the level of financial literacy, most surveys use a percentage of correct answers out of the total score. Others check the number of correct questions out of the total number of questions. Finally, two surveys use a weighted average based on factor analysis.

Huston (2010) conducted an even more comprehensive study to determine what barriers exist to creating a standardised measure of financial literacy. She analysed 71 different studies. She found out that nearly three-quarters (72%) of the studies did not provide a definition of financial literacy. Furthermore, she discovered that 47% of the studies equalled financial knowledge to financial literacy. When analysing the results of the conducted surveys, she noted that around 90% of them did not provide an estimate on the level of

financial literacy of a respondent. In the end, she concluded that the main obstacles to the adoption of a standard global measure of financial literacy are the lack of a standard definition of financial literacy and the lack of a comprehensive instrument that measures all aspects of personal finance. The final obstacle is the interpretation of the instrument because, as mentioned earlier, most of the studies to date do not provide a scoring system or a guide for interpreting the results (Huston, 2010, p. 305).

		Measurement Strategy ^a		Content Domain ^b		
Publication	Operational Definition ^c	SA	PT	s	Ι	D
Volpe, Chen, & Pavlicko (1996)	Percent correct on 10 multiple-choice items ^d		X		Х	
Chen & Volpe (1998)	Percent correct on 36 multiple-choice items		X	Х	Х	Х
Volpe, Kotek, & Chen (2002)	Correct responses on 10 multiple-choice items ^d		Х		Х	
Hilgert, Hogarth, & Beverley (2003)	Percent correct on a knowledge test		Х	Х	Х	Х
EINRA (2003)	Correct responses to 10 true/false items	x	X			
Moore (2003) Financial knowledge: Number of correct responses to 12 binary-choice items. Financial experiences: Report having financial experiences across 14 items. Financial behavior: Report engaging in positive and negative behaviors across 15 items. Debt confidence: Responding "completely" or "very confident" regarding debt considerations		X	x	Х	Х	Х
Mandell (2004)	Percent correct on a 31-item knowledge test		X	Х	Х	Х
Agnew & Szykman (2005)	Number of correct responses to 10 multiple choice and true/false items. Also, self-rated investment knowledge relative to others on 1-10 scale.	Х	Х		Х	
National Council on Economic Education (NCEE) (2005)	Percent correct on 24-item knowledge test		Х	Х	Х	Х
Lusardi & Mitchell (2006, 2008); Mexican version in Hastings & Tejeda- Ashton (2008)	Correct responses to 3 multiple-choice and true/false items		Х	Х	Х	
Lusardi & Mitchell (2007a)	Correct responses to 3 computational items		Х		Х	
Lusardi & Mitchell (2007b)	A single weighted average of correct/incorrect responses (based on factor analysis) of 5 multiple-choice basic financial literacy items and 8 multiple- choice sophisticated financial literacy items. Separately considered a 7-point item on perceived knowledge.	х	х	Х	Х	
Mandell (2007)	Percent correct on a knowledge test		X	Х	Х	Х
van Rooij, Lusardi, & Alessie (2007)	<i>Two weighted averages of correct/incorrect responses</i> (based on factor analyses) for (a) 5 multiple-choice basic financial literacy items and (b) 11 multiple-choice sophisticated financial literacy items. Separately considered a 7-point item on perceived knowledge.		х	Х	X	
Lusardi & Tufano (2008)	Correct responses to 3 individual multiple-choice items	Х	Х			Х
ANZ Bank (2008)	Mean score, based on target responses to 26 questions derived from an operational framework	Х	Х	Х	Х	Х

Figure 3: Strategies for measuring financial literacy

SA = Self Assessment, PT = Performance Test

^bS = Savings, I = Investment, D = Debt, N = Numeracy

^c Italics have been added throughout to emphasize key definitional components.

^d This study labels the construct investment literacy.

Source: Hung, Parker & Yoong (2011).

With a comprehensive measurement method that takes into account every component of financial literacy, a survey can provide very valuable insights. For example, it will be able to identify whether a respondent or group that is experiencing financial difficulties is in that position because of a lack of financial education and poor decision-making, or whether there

is some other reason. This can help address the real problem and add value in the long run (Huston, 2010, p. 310).

1.5 Results from past measurements around the world

Probably the largest survey measuring financial literacy in the world was conducted by Standard & Poor's Rating Services. The survey to which more than 150 thousand people responded, consisted of four questions, one for each, risk diversification, inflation, numeracy, and compound interest. A person is considered financially literate if he or she gave correct answers to three out of four questions. According to this criteria, two thirds of the adults in the world are financially illiterate. As we can see in Figure 4, the number of financially literate people varies across countries (Klapper, Lusardi & Oudheusden, 2017).

Figure 4: Global financial literacy (% of adults who are financially literate)



Source: Klapper, Lusardi & Oudheusden (2017).

Klapper, Lusardi & Oudheusden (2017, p. 9) conclude that richer countries, have on average a higher number of people who are financially literate, however this seems to hold only for the top half of the countries by GDP per capita. The difference in GDP per capita explains up to 48% of the variation (Klapper & Lusardi, 2019, p. 11). Furthermore, they speculate that the higher quality of education could be one of the reasons for the disparity.

Another cross-country research was conducted by the OECD in 2017 using a survey designed by Kempson (2009) and eventually updated in 2018 (OECD, 2018). The research

was conducted among G20 countries, and financial literacy was measured as the number of correct answers to 21 questions divided in three categories (Figure 5). Only four countries had over two-thirds correct answers on average, France, Norway, participating as guest country in the survey since it is not a G20 member, Canada and China (OECD, 2017, p.7). Additionally, fewer than half, or around 48% gave correct answers to more than 70% of the questions in the financial knowledge category. According to the methodology, the threshold of 70% is a minimum score for a financially literate person.

Figure 5: Financial literacy score among G20 countries



Stacked points (weighted data): all respondents, sorted by overall score out of 21 (reported in parenthesis)

'Average, G20 countries' reports the mean of the country percentages for all G20 countries with comparable data (excluding the Netherlands and Norway). Each country is therefore given equal weight, irrespective of sample size or population size. Overall scores presented in parenthesis. These may not exactly reflect the sum of the three components due to rounding. G20 countries that are excluded from this chart do not have comparable data.

Source: OECD (2017).

There are many other surveys of financial literacy, but most of them measure the financial literacy of one country rather than investigating cross-country differences. Huston (2010, p. 297) identified 71 different measurements on 52 data sets.

1.6 Financial literacy and retirement planning

I have shown that high level of financial literacy has a positive impact on people's daily lives. Research suggests that financial literacy also has a positive impact on retirement planning. Financially literate people are in fact better off when they reach this point in life than people with low financial literacy, or financially illiterate people.

Clark, Lusardi & Mitchell (2017) conclude that people with higher level of financial literacy are better prepared for retirement overall, they invest a higher percentage of their salary towards retirement savings and are more likely to participate in the stock market. They also, have higher accumulated wealth when they reach retirement (Lusardi, Michaud & Mitchell 2011, p. 28; Nolan & Doorley, 2019, p. 18).

Fornero & Monticone (2011, p. 560) investigate pension plan participation in Italy. They conclude that higher financial literacy contributes to the probability of a person participating in a pension fund. Lusardi & Mitchell (2011b, p. 523) reach to a similar conclusion in a research done for the USA. Namely, financial illiteracy has a negative effect on the financial wellbeing of people after they retire. They argue that increasing financial literacy of the population, especially those with low income, is of utmost importance. This would in turn help them to have a stable retirement. Similar to research in other countries, Boisclair, Lusardi & Michaud (2015, p. 16), conclude that financial literacy in Canada has an impact on retirement planning, as financially literate individuals are more likely to plan for their retirement. In Switzerland, people with higher level of financial literacy are more likely to participate in a voluntary pension fund or invest in the stock market (Brown & Graf, 2013, p. 17). In a research in the Netherlands, van Rooij, Lusardi & Alessie (2011b, pp. 604-605) conclude that many households do not plan for retirement, but even in this case, financial literacy increases the probability to do so.

It seems that in every country where there has been a research on this topic, there is a pattern that is consistent. Financial literacy has a positive impact on retirement planning and the financial wellbeing after retirement, even if in some countries like Sweden (Almenberg & Säve-Söderbergh, 2011, p. 17-18) the impact is lower.

2 PENSION SYSTEM AND RETIREMENT SAVING IN THE REPUBLIC OF NORTH MACEDONIA

2.1 General information about the Republic of North Macedonia

The Republic of North Macedonia is a landlocked country located in the southern part of the Balkan Peninsula. It is the only country to have separated from Yugoslavia without bloodshed, in 1991. According to a report by Eurostat (2020), the country has a population of about 2.1 million, however, there has been no census since 2002, so it is very likely that the number of people living in the country is significantly lower (Hopkins, 2020). If vaccines help slow down the global pandemic, the country will conduct last year's postponed census in 2021. The official language of the country is Macedonian, while Albanian is the co-official language in the country. The official currency of the country is the Macedonian Denar (MKD), which was pegged to the Deutsch Mark after independence and now to the Euro (Jovanovic & Petreski, 2012, pp. 598-599).

2.2 The economy of the Republic of North Macedonia

After independence in 1991, the Republic of North Macedonia began to introduce a system of its own national economy. The country has introduced a system of open market economy.

In the last decade of the last century, i.e. in the 1990s, the Republic of North Macedonia faced major economic problems. During the transition period and the establishment of new socio-economic conditions, the country suffered from poor estimations and setbacks in the introduction of the market economy. The period was accompanied by very high inflation and a significant decline in GDP (Petrevski, 2005). In addition to this, the country faced many difficulties from outside, mostly from neighbouring countries. First of all, it was the Greek trade embargo due to the country's official name and flag. It had a significant, negative impact on the development of the country (Mitevski, Moussa, Tevdovski, Zarotiadis 2020, p. 4). Eventually, more than 20 years later, it led to the new official name of the country, Republic of North Macedonia. A few years after the embargo, two other important events occurred that had an impact on the country and an internal military conflict in Kosovo and the influx of refugees into the country and an internal military crisis in the country in 2001 (Radovanovik-Angjelkovska, 2014, p. 72). Finally, the most recent blockage comes from the eastern neighbours, Bulgaria, who vetoed the start of the negotiations with the European Union in 2020 (Peel, Hopkins & Hindley 2020).



Figure 6: Annual GDP growth rate of the Republic of North Macedonia

Source: The World Bank (2020a).

In Figure 6 we see the decline in GDP in the years after the independence, as well as during the internal conflict in 2001, the 2007-08 financial crisis (1 year lag) and the European debt crisis in 2012. The country's economy had the highest growth in 2007 at 6.5%. According to the International Monetary Fund (2020), the Republic of North Macedonia had the sixth

lowest GDP per capita in Europe in 2019. The only countries with lower GDP per capita were neighbours Albania and Kosovo, fellow EU candidate from the Balkans, Bosnia and Herzegovina and Eastern European countries, Ukraine and Moldova.

From the independence to the present day, the Republic of North Macedonia has had consistently high unemployment rates, among the highest unemployment rates in Europe. Since the peak in 2005, when the unemployment rate was 37.5%, we can observe a constant downward trend, reaching a low of 16.4% in 2020 (The World Bank, 2020c).



Figure 7: Unemployment rate in the Republic of North Macedonia

Source: The World Bank (2020c).

2.3 Past research on financial literacy in the Republic of North Macedonia

The country has improved its overall adult literacy rate from 94% in 1994 to 98% in 2014, which is the most recent data available (The World Bank, 2020b). Meanwhile, three separate surveys have been conducted in the country to measure financial literacy and the results are not so encouraging.

The Standard & Poor's Global Financial Literacy Survey showed alarming results worldwide and a gap in financial literacy between developing and developed countries. In the case of the Republic of North Macedonia, the gap is enormous when compared to the top performers in the survey. People living in countries in Scandinavia perform best. In Denmark, Norway and Sweden, 71% of the adult population is classified as financially literate, according to the survey (Figure 8). Moreover, we can observe in the same graph that other developed countries have above 50% of financially literate adults. None of the Balkan countries has exceeded the 50% mark. Montenegro came close to this score with 48% of financially literate adults. The EU members from the Balkans have above 40% financially literate adults, with the exception of Bulgaria which has 35%. North Macedonia has 21% of financially literate adults, according to the survey. Neighbouring Kosovo and Albania are the only two countries scoring lower in Europe. This shows a problem not only in the country but also in the region, as Bulgaria and Tukey's results are not particularly impressive and Albania has the second worst result with Afghanistan (14%), only one percentage point above the absolute worst result of Yemen (Klapper, Lusardi & Oudheusden, 2017, pp. 23-25).





Source: Klapper, Lusardi & Oudheusden (2017, p. 23-25).

The second survey to measure financial literacy in the country is the OeNB survey (Reiter & Beckmann, 2018). The survey is based on three questions which measure knowledge of interest rates, inflation and risk diversification (Lusardi & Mitchell, 2008). Score on the survey is measured by number of correct answers.

Countries are ranked by the percentage of respondents who answered all three questions correctly. In this ranking, the Republic of North Macedonia ranks 20th out of 25 countries where the survey was conducted. The only lower scoring countries in Europe are, again neighbouring Albania, another Western Balkan country, Bosnia and Herzegovina, Romania, and Russia (Reiter & Beckmann, 2018, p. 44). Croatia and Serbia are ranked 18th and 19th respectively. This is a similar pattern to the S&P survey and confirms a gap between developed and developing countries, as well as a general problem, low level of financial literacy in countries in the region.

A GFK (2018) survey based on the OECD methodology (explained in the first chapter) is the third and most comprehensive measure of the level of financial literacy of the population in the Republic of North Macedonia.



Figure 9: Financial literacy score of selected countries

Source: GFK (2018, p. 26); Krstevska & Pavleska (2019, p. 5).

The country is at the bottom of the table based on the scores, as we can see in Figure 9, which is consistent with previous surveys. Interestingly, Albania has a higher score, which is on par with the G20 average. This contradicts the results of previous surveys. Croatia, on the other hand, is just above the Republic North Macedonia, which is in line with the OeNB survey. As the survey is based on the same methodology, it is comparable to the OECD G20 survey shown in Figure 5. Combining the data, Poland and Italy are the only European countries with a lower score than the Republic of North Macedonia.

In all three surveys, the country has a consistently low score, however in a self-assessment of financial literacy, only 8.2% of Macedonians gave themselves "somewhat low" and 11.6% "very low" scores (The alternative financial services association of North Macedonia, 2019).

2.4 The pension system in the Republic of North Macedonia

The Macedonian pension system was based on the principle of intergenerational solidarity, where current contributions are used to finance current pensions (Uzunov, 2011, pp. 117-120). In 2006, the system was reformed, and the principle of pension insurance was fully introduced. In addition to the first, mandatory, pillar, two more, mandatory and voluntary private pension pillars were added in 2008. As a result, today the structure of the pension

system in Macedonia consists of three pillars: the first pillar is mandatory and is still based on the principle of intergenerational solidarity. The second is mandatory individuallycapitalized pension saving. The third pillar is similar to the second, but it is completely voluntary. People can participate in only one of the mandatory pillars, while everyone can participate in the third.

Compulsory pension and disability insurance based on generational solidarity (the first pillar) is organized according to the principle of current financing (pay-as-you-go). This means that current insured people pay for current retirees. This pillar operates on the principle of defined pensions, which means that through it, pensions are provided according to a predetermined formula that depends on the salary and the years of working experience of the insured. This pillar ensures the realization of rights of the pension and disability insurance in case of old age, disability, and death, which means that part of the old-age pension is paid, then disability pension, family pension, as well as the lowest amount of pension (Vuchev, 2009, p. 266).

The second, mandatory pillar for all people that have their first employment after the beginning of the year 2003, differs drastically from the first pillar. Within the second pillar each member has an individual account, on which all his assets are recorded, and which enable connection and interdependence between the paid contributions and the future pensions of the members. The pension is based on the accumulation of funds, monthly mandatory payments, on individual accounts that are invested. The return on investment is reduced by the operating fees set by the provider of the pension fund. The fees are regulated by law. People with first employment before the year 2003, may also enter this pillar voluntary. After reaching retirement age, the accumulated funds and returns are paid out as monthly instalments (Uzunov, 2011, p. 118)

The third pillar, fully funded pension insurance of one's own accord, is based on the capitalization of assets according to the principle of defined contributions, but on a voluntary basis. What is important for this pillar is that it can include all persons who want to have an additional income stream after retirement in addition to the mandatory pension insurance. It may also include all persons who are not covered by compulsory insurance (in the first and second pillars), for example freelancers who do not participate in the mandatory pillars. In addition, the third pillar enables the establishment and financing of professional pension schemes. Each insured person can have a voluntary individual account in a voluntary pension fund and a professional account in a voluntary pension fund. The funds are invested in accordance with strictly defined legal requirements, which ensures the highest level of protection for the interests of the insured and their assets. Members are regularly informed about how and where their assets are invested, as well as about the return on investments (Uzunov, 2011, p. 118).

The pension system of Northern Macedonia according to the Law on Pension and Disability Insurance (Law on Pension and Disability Insurance, 1983) recognizes three types of pensions:

- Old-age pension
- Family pension
- Disability pension

Today, the legal condition for receiving an old-age pension is that the person has reached the age of 64 or 62 with at least 15 years of professional experience. In view of this, it is necessary to emphasize that the government is currently considering some changes that could increase the retirement age.

Only close relatives, a child, a spouse or a parent of a deceased person whom they supported are entitled to a family pension. The amount of the pension is determined as a percentage of the retirement or disability pension the member would have had at the time of death, as follows: 70 percent for a family member, 10 percent for each additional dependent member, but not more than 100 percent total.

Disability pension can be received as a result of an accident at work or occupational disease, regardless of the length of retirement. It may also be received as a result of an accident outside work or illness, provided that the person meets certain conditions relating to age and years of service completed on the date the disability occurs. The amount of this pension is: 80 percent of the pension base if the disability was caused by an accident at work or an occupational disease. The pension base depends on years of service and age if the invalidity is caused by an accident outside work or an illness.

2.5 Sustainability of the pension system in the Republic of North Macedonia

Pension system reforms have been completed, but in Northern Macedonia, as in many other Western European countries and in other countries around the world, there is a clear trend towards an ageing population. This will most likely put a significant strain on the pension system. According to the projections of United Nations, in 2050 the dependency of the adult population (which includes people who have reached the age of 65) in Northern Macedonia will be more than 45%. By comparison, in 2000, adult population dependency was only about 15%. These major demographic changes indicate that a larger proportion of the population will rely on the pension system in the future. As a result, the number of people unable to meet all necessary living costs in old age will increase. Finance Think's research provides data on the sustainability index of the pension system in the Republic of North Macedonia (Petreski & Gacov, 2018).

Sub-Index	Weighting	Indicators	Weighting of indicators in the subindex
	0.3	Old-age dependency ratio in 2010	0.200
characteristics		Old-age dependency ratio in 2050	0.400
		Change 2010 - 2050	0.400
		Legal retirement age for men	0.050
	0.35	Effective retirement age for men	0.075
Pension system		Legal retirement age for women	0.075
design		Effective retirement age for women	0.075
		Replacement rate	0.350
		Coverage of working age population	0.350
	0.35	Pension expenditures (% of GDP)	0.333
Public finances		Public debt (% of GDP)	0.333
		Transfers from the central budget for pensions (% of total expenditures)	0.333

Table 2: Pension sustainability index in Macedonia- elements

Source: Petreski & Gacov (2018, p. 15).

The index is constructed according to the methodology of the Allianz Pension Sustainability Index (Allianz, 2020) and includes:

- selection of indicators,
- normalization,

- weighting and
- aggregation in one index.

The Allianz Index is published for 54 countries in the world, but not for North Macedonia. The purpose of the index is to assess the trend of sustainability of the pension system in the analysed period and to make a comparison with the pension systems of other countries. Hence, this index will serve as a good comparison basis with the pension systems of other countries. The index ranges from 1 to 10, where 1 indicates complete unsustainability and 10 indicates complete sustainability of the pension system (Petreski & Gacov, 2018). The index is derived from three sub-indices (Table 2), based on demographic characteristics of the country, the design of the pension system and the public finances of the country.

In the past two decades, the index of the pension system in Northern Macedonia has never been higher than 5.60. Figure 10 shows the value of the index in the years from 2002 to 2016. The graph shows that the sustainability of the pension system improved from 2003 to 2008 according to the methodology of the Allianz Pension Sustainability Index, reaching the highest value, 5.6 in 2008. After 2008, the index shows a significant decline. This decline is caused by the increase in public spending on pension support as well as the increase in public debt from one year to another. In 2016 the value of the index is just below 4.80 which is the lowest measured value. According to the index, the pension system in the Republic of North Macedonia has a low sustainability value, especially after the decline, similar to Greece and Slovenia, and reforms of the system are necessary to improve sustainability (Petreski & Gacov, 2018, pp. 15-16).



Figure 10: Pension sustainability index for the Republic of North Macedonia

The Centre for Economic Analysis (CEA) has conducted additional research on the sustainability and conditions of the pension system. Compared to the previous research, this

Source: Petreski & Gacov (2018, p. 16).

research uses the support indicator and tries to analyse the available figures. The support indicator indicates the ratio of the number of employees or insured persons compared to the number of pensioners. In the case of North Macedonia, this indicator has increased significantly from the lowest values recorded in the period between 2002 and 2006, but the improvement has been slow, as shown in Figure 11. The slow pace can be attributed, on the one hand, to the increase in the number of pensioners, a figure that is expected to rise in the future as life expectancy increases, and, on the other hand, to the relatively moderate decline in the unemployment rate in the country (Nikolov, Sukarov &Velkovska 2017, pp. 13-14).

Figure 11: Support indicator of the pension system



Ratio between insured employees and retirees

Source: Nikolov et al. (2017).

In contrast to the previous research, Nikolov, Sukarov, Velkovska (2017) conduct several simulations to observe the level of sustainability of the pension system of the Republic of North Macedonia in the long run. According to their simulations, the pension system is sustainable in the long run (2030). After 2025-2026, the pension system starts to generate surplus. The surplus is higher or lower depending on the projections of the variables used in the authors' simulations. The most positive simulations are those that assume GDP growth averaging 5% per year, indicating the need to find mechanisms to accelerate growth. The pension system might be unsustainable without certain level of GDP growth.

It seems that different authors have different expectations about the future of the pension system in the country. Given the uncertainty and the fact that disposable income decreases after retirement, it would be wise for people to have an additional source of income after retirement.

2.6 Saving and investment culture in the Republic of North Macedonia

Macedonians, as I mentioned earlier, do not have a habit of saving. In the above mentioned survey conducted by The alternative financial services association of North Macedonia (2019), only 21.7 % of the respondents answered that they save regularly. According to other findings of the survey, more than half of the people (57%) have difficulty buying more expensive items that are somewhat necessary for daily life (electronics, such as refrigerator or a TV). A similar number of respondents (51%) have not used any financial services in the last 3 years. According to the results of this survey, lack of, or low disposable income is the main reason why very few people save regularly, with lack of knowledge or inclusion coming at second place. Double digit unemployment rate and arguably low GDP growth rate, at least for a developing country, will not be a catalyst for a change anytime soon.

GFK (2018) conducted a similar study to examine the level of awareness (i.e., whether they have heard of the financial product) of the population with respect to selected financial products. The results are presented in Figure 12. As we can see in the chart, most of the population is familiar with basic products like loans, accounts, credit cards, etc. However, less than 60% have heard of retirement products or stocks, only 45% have heard of bonds, and less than a third have heard of mutual or trust funds.



Figure 12: Awareness of financial products (% of population)

Source: GFK (2018, p. 27).

The data from both surveys help explain why according to the Agency for Supervision of Fully Funded Pension Insurance (2021) data, there are only 26 017 individual accounts in the voluntary pension funds that form the third pillar of the pension system in the country, at the end of 2020. This number is significantly less than 2% of the total population (note

that only people aged 15-70 can participate). On Figure 13 we can see a reasonably normal distribution across age groups, with slightly more men than women participating. Out of the 26 thousand individual accounts almost 15 thousand are professional accounts, meaning that employers have organized an additional pension insurance for their employees. This means that only about 11 thousand people in the country, less than 1%, have thought of opening an account and investing in the voluntary pension funds, to have an additional source of income after retirement. Out of the total 26 thousand, individual accounts, only 835 were opened in 2020. An increase of 3.3% compared to the previous year. However, COVID -19 may have had an impact here as many people were laid off or had their disposable income reduced.



Figure 13: Participants in the voluntary pension funds by age

Source: Agency for Supervision of Fully Funded Pension Insurance (2021, p. 35).

In addition to pension funds, there are 6 companies that offer an alternative investment method, or investment funds in the Republic of North Macedonia. The amount of assets under management in these funds is another confirmation of the low level of saving and investing among the population in the country. According to the Securities and Exchange Commission of the Republic North Macedonia, these funds had assets under management of 145 million euros at the beginning of 2021. Of these KB audience manages more than half in the 4 different funds they manage (Figure 14). Together with the second and third largest funds in the country, WFP, and Generali respectively, they take 94% of the market share. In comparison, NLB skladi, the largest asset manager in Slovenia, a more developed country but comparable regarding size and population, has over 1 billion EUR assets under management.



Figure 14: Market share of investment funds

Source: Securities and exchange commission of the Republic of North Macedonia (n.d).

3 METHODOLOGY

To answer the research questions and measure the level of financial literacy of citizens in the Republic of North Macedonia I conduct a survey based on the questions used by van Rooij, Lusardi & Alessie (2011b). Due to the circumstances in 2020, lockdowns, recommendations to limit contact and similar measures enforced to stop the global spread of COVID-19, I decided to conduct the survey online. I chose Google Forms, as the platform to conduct the survey with. It is simple to use, mobile and user friendly, and there are multiple formats supported to extract the final data once the survey is completed.

The Republic of North Macedonia has claimed to be the first country, other than countries with significantly smaller territories (Vatican, Monaco, etc.), to have 95% of its population covered by a wireless broadband network (Nairn, 2006). In 2005 USAID helped to achieve this coverage and in the meantime, also reduced the cost of internet access by up to 75%. In the beginning of 2020, the internet penetration in the Republic of Macedonia was 81% (Kemp, 2020). Therefore, internet access would not be a problem to get a representative sample of the population. However, I assumed that people aged 50 and older would be underrepresented because they do not have the skills to participate in an internet survey. To address this issue, I conducted additional telephone interviews.

3.1 Sample

Before distributing the questionnaire, I tested it to make sure that the questions were concise, and all the possible answers were covered in the offered choices. The test was conducted

with 6 subjects, chosen to represent different age groups, level of education, gender and most importantly both, people who had and had not studied or graduated in the field of economics. I received valuable feedback regarding the questions and added options in couple of the control questions accordingly. Compelling was the feedback I received from one of the respondents in the testing phase, a person with a graduate degree in another field. He thinks the questions designed for measuring financial literacy were not hard and he felt that he should know the answers. However, his medical degree never provided him with the training necessary to answer most of the questions correctly.

After the testing phase was complete, I decided to use the exponential non-discriminative snowball sampling method to distribute the questionnaire. This is a method in which each affiliate is asked to provide additional subjects or share the questionnaire forward to other possible subjects (Goodman, 1961, p. 148). My goal was to collect at least 300 completed questionnaires. I initially contacted approximately 150 subjects, of whom approximately 100 responded and confirmed that they had completed the questionnaire and provided additional subjects or claimed to have forwarded the questionnaire themselves. Based on the feedback and responses I received, I estimate that between 1200 and 1600 people, including 27 telephone surveys, were invited to complete the questionnaire. Of these, 746 completed and returned the questionnaire in full.

Of these, 51.6% were female and 48.4% were male, which roughly corresponds to the actual breakdown of the male and female population in the Republic of North Macedonia, 50.1% male and 49.9% female (State Statistical Office, n.d.).



Figure 15: Share of respondents by gender

Most of respondents, just over one third of the total, were between 25 and 34 years old. The second largest group or about one fifth of the respondents were between 35 and 44 years old. The age groups 18-24 years, 45-54 years, and 55-64 years each had between 12% and 14%

Source: Own work.

of the total respondent. This would sum up to about 100 respondents per group. This means that each group is sufficiently represented in the sample. The remaining eight respondents were 65 years or older and are already retired and therefore were not included in further analysis. Along with them, another 4 respondents who are already retired but younger than 65 years were also excluded from the analysis. As it is evident in Figure 16, the sample is a good representation of the population in the country.





More than half of the respondents live in the two largest cities in the country, Skopje, the capital, and Bitola, the second largest city. The rest of the respondents are distributed among few of the larger cities in the country, such as Kumanovo, Tetovo, Prilep, Ohrid, Shtip, and almost 15% are from smaller towns and rural areas. Eight percent of the respondents are currently living abroad. Similar to the already retired respondents, they are excluded from further analysis. The sample is a good representation of the population. As shown in Table 3 only people living in the second largest city, Bitola are overrepresented.

Unfortunately, I could not find any relevant source regarding the educational level of the population in the Republic of Macedonia. The State Statistical Office - Education and Science Sector, provides annual data on the number of students enrolled in universities and the number of students in primary and secondary schools. Due to limitations with the COVID -19 pandemic and the snowball method used to maximize the number of respondents, about 70% of respondents have a university degree or higher education. Although there is no official data, I can speculate that this is not an accurate representation of the population. However, further analysis of the impact of financial literacy on retirement planning will take this into account as education level is included as an independent variable.

Source: Own work.

Place of residence	Number of respondents	Share in sample	Share in country
Bitola	253	34%	4%
Skopje	156	21%	25%
Other city or rural area	98	13%	n.a
I live abroad	60	8%	n.a
Kumanovo	48	6%	4%
Prilep	41	5%	3%
Ohrid	32	4%	2%
Shtip	31	4%	2%
Tetovo	27	4%	3%

Table 3: Share of respondents by place of residence

Source: Own work.

Lusardi & Mitchell (2011, p. 5) had a similar problem in their research on the effect of financial literacy on retirement planning, with the addition that most of their respondents were high earners. They concluded that the general level of financial literacy among the population will be overestimated. I agree with their conclusion, therefore my estimate of the overall financial literacy in the Republic of North Macedonia will also be higher compared to a more representative sample. The rest of the respondents, around 30% have completed secondary school (around 28%) or lower (less than 1%).



Figure 17: Share of respondents by highest level of completed education

Source: Own work.

Three factors contribute to the very low number of respondents who have completed less than secondary school. First, secondary school is mandatory in the Republic of North Macedonia (*Law for Secondary School*, 1995). Also, the survey was conducted online, increasing the likelihood that a person with less than a secondary education would have difficulty accessing and completing the survey. Finally, as mentioned earlier, due to the lack of data, I would speculate that the majority of individuals living in the country with less than a secondary education are either nearing retirement or have already retired.

Nearly three-quarters of the respondents are employed full time, while slightly less than 8% are either part-time employees (3.2%) or freelancers (4.3%). The number of freelancers in the country is increasing recently as more young adults either emigrate from the country or choose to work remotely for a foreign company. More than 8% of the respondents are unemployed, while in the country the number is 16.5% (State statistical office, 2020). Finally, almost 9% of the respondents were students and about 1% were retired.



Figure 18: Share of respondents by employment status

Almost half of the respondents have an average monthly net income between 15 and 30 thousand MKD. This range is slightly above the minimum net salary and slightly above the average net salary in the country. About 9% have a monthly net income of up to 15 thousand MKD, which means they get by on the minimum salary or less than the minimum salary (there are certain exceptions in the law that allow employers to pay lower than minimum salary to employees). Almost 14% of respondents have no monthly income and are dependent on other family members. One third of the respondents have a monthly net income that is above the average salary in the country, out of them 14% earn more than 50 thousand MKD per month.

Source: Own work.



Figure 19: Share of respondents by average net monthly income

Source: Own work.

3.2 Questionnaire

To measure the financial literacy of the population in the Republic of North Macedonia I used a set of questions that van Rooij, Lusardi & Alessie (2011b) compiled and used to measure financial literacy in the Netherlands. The questions are divided into three sections, first the demographic questions, in the second section are five financial literacy questions and in the last section are the advanced financial literacy questions. The questions have been adapted for use in the Republic of North Macedonia, for example currency, but the essence of the questions has not been changed. To avoid bias, the questions were translated in Macedonian language.

The questions in the same format as in the questionnaire can be found in Appendix 2, English language and Appendix 3, Macedonian language.

4 **RESEARCH AND FINDINGS**

4.1 Basic financial literacy in the Republic of North Macedonia

Since the goal is to assess the financial literacy of people in the Republic of North Macedonia and then examine whether it affects retirement planning, I have decided, as mentioned earlier, to exclude people who are already retired and those living abroad from further analysis. These exclusions reduce the sample size from 746 to 674, or 60 excluded respondents who live abroad and 12 excluded respondents who are already retired.
The basic financial literacy of the population is determined by the responses to the second section of the survey, i.e. questions 12 to 16. These questions focus on basic economic concepts that people encounter in their daily lives, such as inflation and interest rates. Every correct answer is marked with one point. The required threshold to consider a person possesses basic financial literacy is four points, or four correct answers.

The first question in this section is a purely mathematical question to assess the numeracy skills of the respondents. As we can see in Figure 20, only 71% of the respondents gave a correct answer to this question. This means that almost one third of the respondents have difficulties with calculating percentages.

The second question required respondents to consider compound interest. The percentage of incorrect answers more than doubled compared to the numeracy question, from 18% to 39%. Slightly less than half (49.5%) gave the correct answer. As shown in the previous chapter, a significant proportion of the country's population do not save regularly or have sufficient disposable income to do so. For this reason, they probably had neither the need nor the opportunity to use an instrument where the concept of compound interest becomes practical.

The third question in the basic financial literacy section relates to inflation. About 57% of the respondents gave a correct answer to this question. It is worth noting that if we include only respondents aged 45 and older, the percentage of correct answers increases significantly to 65%, while only 38% of adults younger than 25 answered correctly. This could be due to the fact that older people experienced periods of high inflation in Yugoslavia and the early years of North Macedonia's independence.



Figure 20: Responses on basic financial literacy questions, % of total

Source: Own work.

Klapper & Lusardi (2019, pp. 13-14) show in their research that in countries with high level of inflation, more people are able to answer the question about inflation correctly compared to other countries. Recent examples in their research include Bosnia & Herzegovina and Argentina.

The next question in this section assesses the understanding of the time value of money of the population in the country. This is the only question in this section where the incorrect answers outweigh the correct ones. Only 44% of the respondents understand the time value of money.

The last question in the section is about money illusion. Nearly three-quarters of the respondents understand that their purchasing power will remain the same if their disposable income increase as much as inflation.



Figure 21: Share of respondents by the number of correct answers

Given the simplicity of the questions, to consider that a respondent has basic financial literacy, I set the threshold at 4 or more correct answers out of the 5 questions in this section. Out of the total sample of 674, only 39% or 260 respondents meet these criteria and can therefore be labelled as financially literate. Out of which 154 (23%) respondents had 4 correct answers and 106 (16%) answered all of the basic financial literacy questions correctly. Of the remaining respondents, most answered either 2 (18%) or 3 (26%) questions correctly. As we can see in Figure 21 the remaining are respondents with 1 correct answer (11%) and no correct answers (6%).

As mentioned earlier, people with academic degrees were overrepresented in the survey, moreover, these respondents had a higher average number of correct answers, so the percentage of financially literate people may be overestimated.

Source: Own work.

However, even if we only consider individuals who have a secondary education or less, the result is still better than the results Klapper, Lusardi & Oudheusden (2017, p. 24) show for the country from the S&P financial literacy survey. In the survey I conducted, 30% of respondents who have completed secondary school or less have basic financial literacy, compared to 21% financially literate people in the country in general according to the S&P survey.

4.2 Cross country comparison of basic financial literacy

For further analysis, I will compare my results to research done in the Netherlands and the United States of America, which are based on the same questions. The difference in development between the Republic of North Macedonia and the United States and the Netherlands is very big to say the least. However, these differences should not affect the comparability of the data. The questions used to measure the financial literacy are simple and understandable regardless of the country's economy. It is worth mentioning again that Lusardi & Mitchell (2011a, p. 5) have similar difficulties with the data as I do. They too have an overrepresentation of people with high level of education, with over 50% of the respondents having a bachelor's degree or higher level of completed education. This is probably the reason for the results we can see in Figure 22. For every question except the interest compounding question, the share of correct answers is higher in the US than in the Netherlands (van Rooij, Lusardi & Alessie, 2011b).

Another reason could be the difference between the countries' financial systems. Even though the Netherlands is far from being an underdeveloped country, the U.S. is arguably leading the world in terms of the financial system in the country, especially if we compare the capital markets as the two largest stock exchanges, the New York Stock Exchange and Nasdaq are the two largest in the world. They account for almost half of the total market capitalization in the world.

If we compare the data from the survey I conducted with the data from the Netherlands and the US, the difference is even more pronounced. For all questions except one, over 20 percentage points fewer respondents from the Republic of North Macedonia give the correct answer. This is besides the fact that more of the respondents from North Macedonia have at least a bachelor's degree compared to the respondents in the Netherlands. It is interesting to note that although the country went through a period of high inflation at the end of the 20th century, fewer people knew the correct answer to the question on inflation.

The differences in the questions about compound interest and the time value of money are not as serious. As mentioned earlier, people are often unable to save in the first place due to low disposable income. However, the large difference in the numeracy question is somewhat alarming, as it is a purely mathematical question and the knowledge to calculate correctly is acquired at the latest in secondary school.



Figure 22: Share of correct answers per question, comparison between countries

Adapted from Lusardi & Mitchell (2011a, p. 21); van Rooij, Lusardi & Alessie (2011b, p. 29)

Further I compare the respondents by the number of questions answered correctly. The survey in the Netherlands does not provide this data. If I keep the same threshold as before, i.e., at least four correct answers out of five questions, in Figure 23 we can see that 80% of the respondents in the US possess basic financial literacy, a figure more than double the 39% in the Republic of North Macedonia. From the data, it can be seen that even just those who answered all questions correctly in the U.S. significantly outnumber those who could give 4 or more answers in the Republic of North Macedonia.

On the other side of the spectrum, the number of people with one or zero correct answers in the US is negligible compared to North Macedonia. However, this comparison involves countries that are far apart in their development, e.g. the total market capitalization of the Macedonian Stock Exchange is below 2 billion EUR and USD 2.3 billion respectively. To put this in perspective, this is less than the market capitalization of Krka d.d., the largest company in Slovenia, and more than twice less than one of the conditions for inclusion in the S&P 500 Index, at least USD 5 billion market capitalization.

Even the large differences between countries should not be an excuse for the poor performance of respondents in the Republic of North Macedonia, especially when it comes to purely mathematical questions, or a concept that has an impact on daily life, such as inflation. All in all, the difference, albeit not as pronounced, was to be expected, especially given the results of previous research (GFK, 2018; Reiter & Beckmann, 2018; The alternative financial services association of North Macedonia, 2019).



Figure 23: Basic financial literacy, comparison between countries

Source: Own work.

4.3 Advanced financial literacy in the Republic of North Macedonia

To assess the advanced financial literacy in the country, I review the answers to the 10 questions from the third section of the survey. These questions have an increased level of difficulty compared to the basic financial literacy questions. In the survey, these are the questions numbered 17 to 26.

In Figure 24, we can see that only two of the ten questions had more than half of the respondents answering correctly. About 61% of the respondents know the main function of the stock market, which was the first question in this section. While three quarters of the respondents (75%) understand that when they buy shares of a company, they are effectively a partial owner of the company. This was the second question in this section and the one most often answered correctly.

More than 40% of the respondents gave correct answers to two other questions in this section. About 42% (5th question in this section) know that stocks usually provide the highest returns over a long period of time. A similar number of respondents, 41% understand that equity is riskier than debt, therefore also understand that stocks are riskier than bonds (8th question in this section).

There are two questions in this section that relate to mutual funds. In the previous chapter, I showed that the majority of people in the country generally do not have enough disposable income to save regularly. Also, I showed that the mutual funds in the country are not very large on a global scale. All of the mutual funds in the country combined have a total of 145 million EUR in assets under management.



Figure 24: Responses on advanced financial literacy questions

Source: Own work.

Therefore, the results on these questions are somewhat as expected. About 32% of the respondents could select the correct statement that mutual funds can invest in different assets (3rd question in this section). Slightly more of the respondents (34%) understand that investing in a mutual fund is less risky than investing in an individual company (9th question

in this section). Another question on risk is the 6th question where 30% of the respondents gave a correct answer while the rest of the respondents are not aware that spreading the investments among multiple assets reduces the overall risk. The remaining three questions in this section are all related to bonds. More than two-thirds of respondents, or 72%, do not know that bonds are a debt instrument (4th question in this section). Even fewer know that bonds can be traded and that it is not necessary to hold a bond to maturity (7th question in this section). Finally, on the most complex question, the relationship between interest rates and bond prices, only 14% of respondents answered correctly (10th question in this section).

There is a positive trend to be observed in the results. Respondents are aware of their lack of knowledge on certain topics, so on most of the questions, "do not know" answers predominate wrong answers. Some psychologists say that awareness is the first step to change. The verbal feedback I received from respondents followed the same trend. For the most part, respondents that gave oral feedback on the difficulty of the questions were aware of the need to change and expressed an interest in learning more about the topics covered in the survey and finance in general. However, a survey will definitely not solve the problem. Country wide, planned actions, as well as economic growth and increase of the disposable income of the population, are more likely to help in the future. If I use the same threshold as the basic financial literacy assessment, 80% correct answers, then a respondent would have to answer eight out of ten questions correctly. If I stick with this threshold, very few of the respondents would be considered to possess advanced financial literacy. In fact, less than 6% of respondents meet this threshold, and only 5 out of 674 respondents answered all questions correctly (Figure 25).





Source: Own work.

Since the questions are significantly more challenging than the basic financial literacy questions, lowering the threshold to 6 out of 10 correct answers would be fair. Slightly more than a quarter of respondents achieved this score. However, to reach a higher level of

financial literacy, a person must first have basic financial literacy. Only 16% of respondents meet both conditions, i.e. at least four correct answers to the basic financial literacy questions and at least six correct answers to the advanced financial literacy questions. We can assume that they possess an advanced level of financial literacy and understand more than just the basic concepts.

4.4 Cross country comparison of advanced financial literacy





Adapted from Lusardi & Mitchell (2011a, p. 22); van Rooij, Lusardi & Alessie. (2011b, p. 30)

In Figure 26, we can see that similar to the basic financial literacy questions, respondents from North Macedonia are lagging behind on all but one question. The gap is even more pronounced than for the financial literacy questions. For many of the questions, specifically five out of seven for which data is available for both North Macedonia and the U.S., the proportion of respondents with correct answers in the U.S. is at least twice the proportion of correct answers in North Macedonia.

Data for the US is incomplete as this survey was conducted with fewer questions in this section.

4.5 Financial literacy in the Republic of North Macedonia by demographic characteristics

So far, I have shown that the financial literacy is low among the population in the country. Before conducting further analysis, I examine the effects of the demographic characteristics on the number of correctly answered questions. To determine whether the means in different demographic categories are different and the difference is statistically significant I use one way analysis of variance, or ANOVA.



Figure 27: Comparison between selected sample for further analysis and total sample

First, I examine the average scores of the total sample I use for the analysis and the excluded respondents. For the 5 questions on basic financial literacy, the 674 respondents gave an average of 2.96 correct answers, slightly less than 60%. As expected, the advanced financial literacy questions were more difficult for respondents, giving an average of 3.79 correct answers, or less than 40% of 10 questions. Before proceeding with the analysis, for comparison as shown in Figure 27, I note that when I include respondents living abroad and

Source: Own work.

retired respondents, there is only a small increase in the number of correct basic financial literacy questions, or 0.01 additional correct answers on average. For the advanced questions, there is a slightly larger increase in the number of average correct answers, or an increase from 3.79 to 3.85. However, 88% of the respondents who live abroad and 66% of the respondents who are already retired have a university degree or higher level of education. Therefore, the increase in average correct answers is logical.

The average number of correct answers varies by gender. Male respondents give a higher average number of correct answers than female respondents. The difference is more pronounced and statistically significant for the basic financial literacy questions, as can be seen in Table 4. There does not appear to be a statistically significant difference between the average correct answers by gender for the advanced financial literacy questions.

Basic financial literacy							
Gender	Mean	Std. dev.	Min.	Max.	Obs.		
Female	2.81	1.37	0	5	354		
Male	3.12	1.47	0	5	320		
Advanced financial literacy							
Gender	Mean	Std. dev.	Min.	Max.	Obs.		
Female	3.71	2.27	0	10	354		
Male	3.88	2.30	0	10	320		
p-value independent t- test basic financial	0.002						
p-value independent t- test advanced financial literacy 0.168							

Table 4: Analysis of variance by gender

Source: Own work.

There is a difference between the average correct answers when we consider the age groups of the respondents. There does not seem to be a pattern in these differences. Respondents who are 55 years old or older appear to be outliers and have the fewest average correct answers along with respondents aged 18-24. Respondents who are between 25 and 34 years old are on the other side of the spectrum and have the most correct answers on average for both basic and advanced financial literacy questions. The analysis of variance test shows with 99% confidence that there is a statistically significant difference between the mean scores of the age categories shown in Table 5.

Given the fact that the country gained independence in the late 20th century and began the transition from communism to democracy, the results are not surprising. Complex banking products were not available, people did not have access to capital markets, and most of the companies were owned by the public sector. After gaining independence, the country faced high unemployment rates and high inflation, while most people who were actually employed had barely any disposable income left to save. As a result, most of the older adults living in the country never had the incentive to improve their financial literacy.

Basic financial literacy								
Age	Mean	Std. dev.	Min.	Max.	Obs.			
18-24	2.61	1.42	0	5	89			
25-34	3.21	1.28	0	5	239			
35-44	2.59	1.43	0	5	152			
45-54	3.12	1.40	0	5	95			
55+	3.07	1.60	0	5	99			
Adv	anced finai	ncial literacy						
Age	Mean	Std. dev.	Min.	Max.	Obs.			
18-24	3.56	2.19	0	10	89			
25-34	4.30	2.46	0	10	239			
35-44	3.24	2.11	0	8	152			
45-54	3.78	2.11	0	8	95			
55+	3.64	2.12	0	10	99			
p-value ANOVA basic financial literacy 0.000								
p-value ANOVA advanced financial literacy 0.000								

Table 5: Analysis of variance by age

Source: Own work.

The level of education completed correlates positively with the number of average correct answers. Respondents who have completed only primary education give the fewest correct answers on average. The number of average correct answers for both basic and advanced questions increases with each additional level of education completed.

Basic financial literacy								
Education	Mean	Std. dev.	Min.	Max.	Obs.			
Primary school	1.75	1.22	0	3	5			
Secondary school	2.62	1.44	0	5	199			
Bachelor's	3.09	1.39	0	5	330			
Master's	3.10	1.40	0	5	112			
PhD	3.39	1.42	0	5	28			
Advanced financial literacy								
Education	Mean	Std. dev.	Min.	Max.	Obs.			
Primary school	2.75	2.60	0	7	5			
Secondary school	3.03	1.02	Δ	0	100			
	5105	1.95	0	ð	199			
Bachelor's	4.04	2.26	0	<u> </u>	330			
Bachelor's Master's	4.04	2.26 2.54	0 0 0	8 10 10	<u> </u>			
Bachelor's Master's PhD	4.04 4.44 3.75	2.26 2.54 2.44	0 0 0 0	8 10 10 10	199 330 112 28			
Bachelor's Master's PhD p-value ANOVA basic financial l	4.04 4.44 3.75 iteracy	1.93 2.26 2.54 2.44 0.000	0 0 0	8 10 10 10	199 330 112 28			

Table 6: Analysis of variance by education

Source: Own work.

The only deviation from this trend is a decrease in the average number of correct answers on the advanced financial literacy questions for respondents who have a doctorate degree compared to respondents who have completed a master's degree. However, this can be explained by the field of education. A higher proportion of respondents who have a master's degree have a degree in economics than respondents who have a doctorate degree. The analysis of variance confirms that the observed differences are statistically significant.

Respondents who had a finance class in high school gave more correct answers, on average, than respondents who never had any education regarding finance in their lives. In addition, respondents who took a workshop, online course, or seminar in finance gave more correct answers on average than respondents who had a finance class in high school. This could be because people have to take an action to enrol in an online course, for example. They may have to pay an enrolment fee, so the incentive to learn could be higher. A finance class in high school might have been mandatory and taken a long time ago, and respondents might have had fewer motives to take something away from it, or the knowledge gained might have been lost over time. Finally, as expected, individuals who have a college degree or are currently studying economics or finance score the highest on average. The statistical analysis proves once again that the difference between the categories is significant.

Basic financial literacy							
Finance education	Mean	Std. dev.	Min.	Max.	Obs.		
Never	2.74	1.47	0	5	271		
In high school	2.85	1.35	0	5	178		
Workshop/online course/ seminar	3.13	1.46	0	5	101		
Degree or study economics	3.44	1.29	0	5	124		
Advanced financial literacy							
Finance education	Mean	Std. dev.	Min.	Max.	Obs.		
Never	2.95	1.96	0	9	271		
In high school	3.58	1.99	0	9	178		
Workshop/online course/ seminar	4.03	2.14	0	9	101		
Degree or study economics	5.74	2.26	0	10	124		
p-value ANOVA basic financial literacy 0.000							
p-value ANOVA advanced financial literacy 0.000							

Table 7: Analysis of variance by finance education

Source: Own work.

Finally, when analysing the average scores by socio-demographic characteristics, I find that there are significant differences when I divide the respondents by monthly income. Respondents in categories with monthly income up to 30,000 MKD, which is approximately the average monthly salary in the country, have similar scores. Respondents with salary above the mentioned threshold have significantly better and above average scores. This means that they have more correct answers on average and are therefore more likely to be financially literate. The differences are statistically significant, as confirmed by the analysis of variance.

Basic financial literacy								
Monthly income	Mean	Std. dev.	Min.	Max.	Obs.			
No monthly income	2.76	1.39	0	5	92			
Up to 15,000 MKD	2.66	1.29	0	5	68			
15,001- 30,000 MKD	2.76	1.44	0	5	304			
30,001- 50,000 MKD	3.37	1.38	0	5	147			
>50,001 MKD	3.54	1.28	0	5	63			
Advanced financial literacy								
Monthly income	Mean	Std. dev.	Min.	Max.	Obs.			
No monthly income	3.57	2.12	0	9	92			
Up to 15,000 MKD	3.44	1.97	0	10	68			
15,001- 30,000 MKD	3.40	2.17	0	9	304			
30,001- 50,000 MKD	4.54	2.31	0	10	147			
>50,001 MKD	4.67	2.68	0	10	63			
p-value ANOVA basic financial literacy 0.000								
p-value ANOVA advanced financial literacy 0.000								

Table 8: Analysis of variance by monthly income

Source: Own work.

4.6 Financial literacy in the Republic of North Macedonia, self-assessment

With the last question of the survey, I encourage respondents to assess their knowledge by themselves. I use a seven-point Likert scale, with 1 as the lowest value and 7 as the highest value.



Figure 28: Self-assessment of financial literacy

Source: Own work.

Similar to the questions on advanced financial literacy, where the proportion of "do not know" responses was significant, respondents seem to be aware of their knowledge or lack of knowledge, so they were not overconfident in their self-assessment. The responses follow a reasonably normal distribution, with a greater proportion of respondents assigning themselves a lower grade.

When I compare the performance on the advanced financial literacy questions with the selfassessed level of financial literacy in Figure 29, it is clear that, on average, respondents were indeed unbiased. The majority of those who assigned themselves the lowest grades, 1 or 2, had the lowest number of correct answers. Those who gave themselves more neutral grades, between 3 and 5, mostly scored in the middle range or had between 3 and 5 correct answers. And with each higher grade, the number of people who scored in the top third increased and the number of people who scored in the bottom third decreased. Finally, most people who assigned themselves the two highest grades, 6 or 7, had scores that belonged in the top third, or 6+ correct answers.





4.7 Retirement planning in the Republic of North Macedonia

To determine respondents' views on retirement and whether or not they are preparing for it, I use three questions in the first section of the survey that are similar to questions used in previous research by various authors (Fornero & Monticone, 2011; Lusardi & Mitchell, 2011a; van Rooij, Lusardi & Alessie, 2011b; Boisclair, Lusardi & Michaud, 2015).

The first of these three questions focus on whether individuals have thought about their finances after retirement. I use a four-point Likert scale to force individuals to make a choice

Source: Own work.

and exclude a neutral choice. In further analysis, I will create a dummy variable where the strongly positive responses or individuals who have thought about retirement will have a value of 1 and the rest will have a value of 0. I will then run a multivariate analysis to see if financial literacy has an impact on whether or not individuals think about their finances after retirement. This will be a step in assessing the impact of financial literacy on retirement planning, if any.

Figure 30 shows that nearly two-thirds of respondents have thought about their finances after retirement. The remaining 36%, those who have given "only a little" or "hardly any" thought, take the value 0 in the multivariate analysis. This includes those who answered, "don't know", as it is logical to assume that they have not given this any thought.



Figure 30: Share of respondents by concern about finances after retirement

With the second of these three questions, I check whether respondents participate in the third, voluntary pillar of the pension system in the Republic of North Macedonia. I include an option to account for the fact that people may want to participate in the future but are unable to do so now simply because they do not have enough disposable income.

The results on this question are compelling. Slightly less than 20% of respondents answered that they already participate in the third voluntary pillar. I have already provided data from the Agency for Supervision of Fully Funded Pension Insurance (2021) that less than 2% of the total population participates in the third pillar. Of course, if we exclude people under 18 and pensioners, the proportion of third pillar participants increases, but it does not come anywhere near the 20% in my sample. Therefore, I assume that this figure is exaggerated in my sample.

Source: Own work.

A likely reason for the discrepancy could be that the respondents did not understand the question correctly and assumed that it was one of the mandatory pension funds, first and second pillar, in which every employee must participate. When I conducted the test, there was no problem with the clarity of the question. Another reason could be lack of attention or incomplete reading of the question. Finally, some respondents could give an incorrect answer for any number of reasons. Most likely, the results are a result of a combination of these reasons.

In addition to the 20% who answered that they already participate, 15% chose the option that they will actually participate in the future. When conducting the multivariate analysis, they are given a value of 1. The rest of the respondents take up a value of 0. This is the second step in assessing the impact, if any, of financial literacy on retirement planning. However, due to the problems with the data mentioned earlier, this may not be a true representation of the current situation.



Figure 31: Share of respondents by 3rd pillar participation

The last question from this set of three questions is designed to check whether respondents already have investments for retirement besides participation in the third, voluntary pillar. I have again added an option for those who do not yet have the means to invest but plan to do so in the future. Similar to third pillar participation, about 20% of respondents answered that they have investments for retirement in the form of securities (stocks, bonds, mutual funds, etc.) or real estate. Of this 20%, about one in four respondents also participate in the third pillar. Another 48% stated that they plan to invest in the future. This is the third and final step toward assessing the impact, if any, of financial literacy on retirement planning.

Source: Own work.



Figure 32: Share of respondents by their investments for retirement

Source: Own work.

4.8 Financial literacy indices

Before conducting the multivariate analysis, I created indices of financial literacy. These indices are used as independent variables in the analysis. To create the indices, I use the same method as van Rooij, Lusardi & Alessie (2011a). First, I created dummy variables for each of the questions used to assess respondents' financial literacy. The dummy variables take the value 1 if the respondent answered the question correctly and 0 otherwise.

After converting the data, I conducted factor analysis on the newly created variables. I used the iterated principal factor method. I used Stata version 13 for this and all other statistical analysis hereafter.

I conducted three different factor analysis, first with the newly created dummy variables for the five financial literacy questions. Second, with the dummy variables for the advanced financial literacy questions. The last one with all of the newly created dummy variables, for the basic and the advanced financial literacy questions. In all three cases, only one factor was meaningful according to the Kaiser Criterion, or had an eigenvalue above 1 All of the other factors in the analysis had eigenvalues well below 1. Therefore, I retained one factor in all three cases. Since I retain only one factor, rotating the factor is not necessary. The factor loadings are shown in Table 9. I used these factors to create three different indices using Stata in the multivariate analysis. I name those indices "Basic financial literacy index", "Advanced financial literacy index" and "Combined index".

Factor loadings						
	Basic	Advanced	Combined			
Q1	0.6377		0.3331			
Q2	0.5166		0.3109			
Q3	0.4722		0.5365			
Q4	0.3755		0.4405			
Q5	0.2311		0.2644			
Q6		0.4282	0.4536			
Q7		0.3312	0.3924			
Q8		0.5240	0.4769			
Q9		0.5269	0.5308			
Q10		0.1895	0.1916			
Q11		0.5079	0.5018			
Q12		0.2967	0.2781			
Q13		0.5121	0.4571			
Q14		0.6019	0.5375			
Q15		0.2008	0.2060			

Table 9: Factor loadings corresponding to categories of financial literacy questions

Source: Own work.

4.9 Financial literacy and retirement planning in the Republic of North Macedonia

Since the dependent variable in all three models is a binary variable, I use a probit model to estimate the coefficients on the independent variables. I run two different regressions for each of the three dependent variables, thinking about retirement, third pillar participation, and investments for retirement. In the first regression, I use the two indices of basic and advanced financial literacy as independent variables, and in the second regression, I use the combined financial literacy index formed from all financial literacy questions, as explained earlier. In addition to the financial literacy indices, I use independent variables for gender, age, education, and income level to control for differences in demographic and socioeconomic characteristics.

In Table 10, we can see that only age has a significant effect on how much, if at all, people think about retirement. Individuals aged 35 to 44 are more likely to think about retirement, and the probability increases with each step into a higher age category. The coefficients are statistically significant and with 99% certainty different than 0. This makes perfect sense because the closer people get to retirement, the more likely they are to think about retirement.

At a cut-off point of 0.5, the model predicts or correctly classifies slightly more than twothirds of the observations. However, the model is more likely to correctly classify observations where the dependent variable has a value of 1. 91% of the time, while only a quarter of the observations where the dependent variable has a value of 0 are correctly classified.

	Basic and adva	anced financial	Combined financial		
	literacy index		literacy inc	lex	
	Coef.	Robust Std. Error	Coef.	Robust Std. Error	
Male	-0.048	0.104	-0.058	0.103	
Age 25-34	0.242	0.179	0.231	0.178	
Age 35-44	0.475**	0.189	0.473**	0.189	
Age 45-54	0.669***	0.214	0.654***	0.213	
Age 55+	0.676***	0.214	0.664***	0.213	
Secondary school	0.625	0.599	0.601	0.595	
Bachelor's	0.858	0.599	0.832	0.595	
Master's	0.688	0.610	0.667	0.607	
PhD	1.034	0.654	0.998	0.651	
Up to 15,000 MKD	0.148	0.215	0.156	0.215	
15,001- 30,000 MKD	0.168	0.171	0.175	0.171	
30,001- 50,000 MKD	0.078	0.198	0.078	0.198	
>50,001 MKD	-0.230	0.234	-0.232	0.234	
Basic financial literacy index	-0.027	0.071			
Advanced financial literacy index	0.094	0.068			
Combined index			0.086	0.062	
Constant	-0.836	0.600	-0.802	0.604	
Sample	674		674		
Chi2	37.47***		37.79***		
Pseudo R2	0.043		0.043		
p-Value test Age=0	0.002		0.002		
p-Value test education=0	0.156		0.173		
p-Value test income=0	0.294		0.265		
p-Value test financial literacy index=0	0.377		0.167		
Sensitivity	91%		91%		
Specificity	24%		23%		
Correctly classified	67%		67%		

Table 10: Multivariate analysis of retirement planning

The dependent variable takes the value of 1 if the respondent has thought/thinks about retirement and 0 otherwise.

* p<0.1 ** p<0.05 *** p<0.01

Source: Own work.

In contrast to other research in the Netherlands, Switzerland, Sweden and the United States (Almenberg & Säve-Söderbergh, 2011; Brown & Graf, 2013; Lusardi & Mitchell, 2011a; van Rooij, Lusardi & Alessie 2011b), where financial literacy increases the likelihood that people think about and plan for retirement, in my research, analysis show that financial literacy does not have an impact on whether people think about retirement. To check whether the problem is due to multicollinearity, I run an auxiliary regression. As I have previously shown, all of the demographic variables have some effect on financial literacy. Therefore, in this auxiliary regression, I take the combined financial literacy index as the dependent variable. I use the demographic variables from the previous model as independent variables. I store the residual and the constant from the results of the residual regression, and I name it the "orthogonal index". This way, I can use only the variance in the index that is not explained by the demographic independent variables. I then use the newly created independent variable to assess the impact of financial literacy on retirement planning. However, the independent variables in the auxiliary regression had low explanatory power (R2=0.132). For this reason, using the orthogonal index as an independent variable yields almost identical results as using the combined financial literacy index.

Next, I analyse whether financial literacy has an impact on participation in the third voluntary pillar of the pension fund. The dependent variable takes the value of 1 if a person already participates or plans to participate in the future, and 0 otherwise. Again, note that there is an overrepresentation of people who answered that they already participate in the voluntary pension fund.

In Table 11 we see the results of the multivariate analysis. Age and monthly income are both statistically significant and different from 0. Contrary to previous analysis, where an increase in age increased the probability that individuals had thought about retirement, here individuals over 55 are less likely to participate in the third pillar. This should not be surprising, as these people have lived in a closed, socialist economy and have also lived through the transition period. They are more likely to be conservative and most likely to have doubts about the financial system. Since their first employment is before the reforms of the pension system in the country, they are participants in the first pillar or the intergenerational solidarity pillar, so they have a certain amount of guaranteed pension to look forward to in retirement.

People who have an average monthly net income of up to MKD 30 thousand are more likely to participate in the third pillar than those who have no monthly income. We can also claim that for people who earn between 30 and 50 thousand MKD per month, but with 90% certainty. Moreover, the effect is stronger for those who earn less. At mean values, ceteris paribus, individuals earning up to MKD 15 thousand are 20% more likely to participate in the third pillar than individuals with no monthly income. Individuals earning MKD 15 to 30 thousand are 17% more likely, and individuals earning MKD 30 to 50 thousand are 11% more likely.

	Basic and ad	vanced	Combined financial		
	financial literacy index		literacy index		
	Coef.	Robust Std. Error	Coef.	Robust Std. Error	
Male	0.128	0.105	0.120	0.105	
Age 25-34	0.137	0.190	0.128	0.189	
Age 35-44	0.040	0.198	0.036	0.198	
Age 45-54	-0.277	0.218	-0.293	0.217	
Age 55+	-0.853***	0.248	-0.864***	0.246	
Secondary school	0.460	0.655	0.428	0.664	
Bachelor's	0.503	0.654	0.473	0.663	
Master's	0.414	0.664	0.389	0.673	
PhD	0.864	0.711	0.819	0.720	
Up to 15,000 MKD	0.602***	0.228	0.607***	0.228	
15,001- 30,000 MKD	0.533***	0.191	0.537***	0.191	
30,001- 50,000 MKD	0.37*	0.220	0.378*	0.219	
>50,001 MKD	0.340	0.257	0.346	0.257	
Basic financial literacy index	-0.055	0.072			
Advanced financial literacy index	0.071	0.067			
Combined index			0.027	0.062	
Constant	-1.288*	0.669	-1.250	0.678	
Sample	674		674		
Chi2	46.03***		44.48***		
Pseudo R2	0.058		0.056		
p-Value test Age=0	0.000		0.000		
p-Value test education=0	0.586		0.632		
p-Value test income=0	0.040		0.038		
p-Value test financial literacy index=0	0.512		0.665		
Sensitivity	8%		7%		
Specificity	95%		96%		
Correctly classified	65%		65%		

Table 11: Multivariate analysis of participation in the voluntary pension funds

The dependent variable takes the value of 1 if the respondent participates (or plans to in the future) in the third pillar and 0 otherwise.

p<0.1 *

** p<0.05 *** p<0.01

Source: Own work.

We can argue that as monthly income increases, the expected pension from the public pension scheme also increases, so the need for an additional source of income after retirement decreases. This reasoning could explain why, as income increases, the probability a person participating or planning to participate decreases, although it is greater than for those with no income.

There is no statistically significant difference in the probability of participation in the third pillar between individuals earning more than 50 thousand MKD per month and those with no income. The reason could be that top earners have enough disposable income to invest themselves or already have other investments that would provide an additional income stream after retirement.

Financial literacy has no measurable effect on participation in the voluntary third pillar of retirement savings. This is in contrast to the results of a similar study in Italy, where financial literacy increases the probability that an individual will participate in a voluntary pension plan (Fornero & Monticone, 2011, p. 560).

The model generally classifies correctly when the dependent variable is 0 but has very low classification accuracy when the dependent variable has the value 1. The data quality issue mentioned above could be the reason for this problem.

For the final analysis, the dependent variable takes the value of 1 if the respondent has investments for retirement, securities, or real estate, and if the respondent plans to invest in the future. If the respondent has no intention to invest or does not consider it necessary, the dependent variable takes the value 0. Age, income, and financial literacy have different but statistically significant effects on the probability that a person has investments for retirement or will invest in the future. Older people are less likely to have investments, most likely for the same reasons, they are less likely to participate in the third pillar.

At mean values, ceteris paribus, people aged 45-54 are 16% less likely to invest for retirement, while people aged 55 and older are 37% less likely to invest for retirement. While age lowers the probability, a monthly net income of more than MKD 50,000, ceteris paribus, increases the probability that a person has invested or will invest for retirement by 15%.

Last but not least, both basic and advanced financial literacy have a positive impact on the probability of investing for retirement. At mean values, ceteris paribus, a 1-point increase in the basic financial literacy index increases the probability of investing by 4.8%. The same increase, ceteris paribus, in the advanced financial literacy index increases the probability of investing by 6.6%.

These results are consistent with expectations, as high-income earners, after covering their current expenses, have more disposable income to put into a savings account or use to invest in various assets. And financially literate people are more likely to have the necessary skills and knowledge to invest and manage their own portfolios, because as the survey results

show, a large proportion of respondents do not know the purpose of stocks or the stock market, and an even larger proportion do not know the purpose of bonds.

	Basic and adva	nced financial	Combined financial literacy index		
	Coef.	Robust Std. Error	Coef.	Robust Std. Error	
Male	0.076	0.109	0.080	0.108	
Age 25-34	-0.157	0.196	-0.146	0.195	
Age 35-44	-0.305	0.202	-0.294	0.202	
Age 45-54	-0.498**	0.220	-0.483	0.219	
Age 55+	-1.029***	0.221	-1.024	0.220	
Secondary school	-0.210	0.471	-0.228	0.479	
Bachelor's	0.032	0.470	0.024	0.478	
Master's	0.357	0.490	0.339	0.498	
PhD	-0.237	0.531	-0.251	0.538	
Up to 15,000 MKD	-0.078	0.226	-0.881	0.226	
15,001- 30,000 MKD	0.156	0.183	0.140	0.182	
30,001- 50,000 MKD	0.117	0.210	0.102	0.210	
>50,001 MKD	0.474*	0.267	0.464	0.266	
Basic financial literacy index	0.137*	0.073			
Advanced financial literacy index	0.189***	0.071			
Combined index			0.257**	0.067	
Constant	0.688	0.488	0.700	0.495	
Sample	674		674		
Chi2	74.95***		74.77***		
Pseudo R2	0.095		0.095		
p-Value test Age=0	0.000		0.000		
p-Value test education=0	0.022		0.023		
p-Value test income=0	0.076		0.081		
p-Value test financial literacy index=0	0.000		0.000		
Sensitivity	93%		93%		
Specificity	24%		24%		
Correctly classified	71%		70%		

Table 12: Multivariate analysis of investments for retirement

The dependent variable takes the value of 1 if the respondent has (or plans to) investments for retirement and 0 otherwise.

* p<0.1

** p<0.05

*** p<0.01

Source: Own work.

CONCLUSION

Financial literacy can make people's lives easier in a world where nowadays people make financial decisions almost daily. If we take a step back and look at it from a different perspective, when we retire, the financial situation that awaits us there will be the sum total of all the decisions we have made up to that point. And most people are bad at making decisions, we are guided by our own biases, make decisions based on irrationality instead of facts. And it is not just ordinary people who suffer from bias, but even highly experienced executives of large companies fail victim to their own biases. An example of this is the widely known winner's curse in mergers and acquisitions, where usually the buyer overpays, often because of executives' overconfidence and overestimation of potential synergies (Shefrin, 2002, p. 237).

To get back to the ordinary people, a swipe of the credit card to buy for example a new pair of sneakers that we do not actually need will not bankrupt us. But, when those kinds of decisions outweigh the good, sound financial decisions, when the time for retirement comes, not only can we retire without savings, but we can retire with accumulated debt also. Since the pension will most likely be only a portion of the salary one received before retirement, it would be quite a difficult situation to get out of. It does not mean that financially educated people will make all the right decisions, but as I've have shown so far, they are more likely to choose a better deal when taking a mortgage. They also, get through financial crisis better, have higher earning potential, etc. So, when it comes time to retire, they are also better prepared and less likely to have financial problems.

To address my research questions, I conducted a survey in the Republic of North Macedonia based on questions used in previous studies conducted in different countries on the same topic to measure financial literacy and its impact, if any, on retirement planning (van Rooij, Lusardi & Alessie 2011b). The survey was primarily an online survey, with additional telephone interviews. I used the exponential, non-discriminative snowball sampling method to distribute the questionnaire and maximize the number of responses. I collected 746 fully completed questionnaires, from which I excluded already retired persons and persons living outside the country, and used the remaining 674 questionnaires for the analysis.

In the Republic of North Macedonia, the situation is pretty concerning. In relation to my first research question, only 39% of people possess basic financial literacy. In my opinion, this is a very low number, especially if we take into account that the questions in the set of five basic financial literacy questions are relatively simple. A comparative analysis of the data with results from the US and the Netherlands shows a significant gap with these developed countries, which is consistent with the findings of Lusardi & Mitchell (2011c). The situation is even bleaker when we assess how many individuals possess a more advanced level of financial literacy. At first glance, it seems that about a quarter of the population reaches this level, but if we add another logical condition that a person with advanced financial literacy must first have basic financial literacy first, the number drops to only 16%. In general, men

in this country have better scores than women, as the data from my survey shows. This is consistent with the findings of Bucher-Koenen et al. (2016, p. 22), which show that women have significantly lower financial literacy scores than men, and with a study from India that reaches the same conclusion (Agarwalla, Barua, Jacob & Varma, 2015).

One positive thing I can take from the survey is the awareness of the majority of respondents about their shortcomings when it comes to their own knowledge, or their own financial literacy. If the first step towards improvement is acceptance, then the outlook for the future might be a positive one and improvement is in order. In addition to this, the National Bank of the Republic of North Macedonia has already launched a campaign to increase financial literacy in the country. People can sign up and attend free lectures. Lusardi et al. (2015, p. 20), show that videos, for example, are more effective in improving financial literacy compared to written tools and materials. In the case of North Macedonia, the lectures will certainly be more similar to videos than written tools. Further research has shown that financial education is more effective in times of need than in random times. For example, people deciding on mortgage financing are more likely to take something away from a lecture on debt than those who have no need for a debt instrument at that time (Mandell, 2011 pp. 6-7). To sign up for the lectures from the National Bank people must have felt some need to take up action. Therefore, if we follow Mandell's (2011) argument, then it is likely that people who take action to sign up for the course will also acquire knowledge and use it in the future.

The pension system of the Republic of North Macedonia is based on three pillars, the first of which is based on generational solidarity and is mandatory, the second, also mandatory, but individually capitalized pension savings. People who had their first employment before 2003 can choose which of the pillars they want to participate in, the rest automatically go to the second pillar. The third pillar is a voluntary one, and according to official data, less than 2% of the population had an account at the end of 2020. From the sample, 64% of the people have thought about retirement, while 35% already participate in the third voluntary pillar or plan to do so in the future. Finally, 68% have already invested in securities or real estate for retirement or stated that they would do so in the future.

I created financial literacy indices derived from performance on financial literacy questions. I used these indices along with additional variables to account for differences in demographic and socioeconomic characteristics and to conduct a multivariate analysis. The results of the analysis show that the probability that people think about retirement increases as the age of the respondents increases. This makes sense as retirement seems too distant for some of the younger people to be part of their thoughts and concerns. While age increases the probability that people have thought about retirement, it decreases the probability that they will participate in the third pillar of the pension system. These people grew up and lived most of their lives in a communist country and may have resistance and distrust of financial products that are new and unfamiliar to them. Another reason could be that they are closer to retirement and the marginal benefit of participating in a voluntary pension fund is lower

given the shorter time frame. Most likely, the reasons are similar as to why age reduces the probability of additional investments in securities and or real estate for retirement.

Regarding the relationship between financial literacy and retirement planning in the Republic of North Macedonia, according to my data and analysis, financial literacy is only significant and increases the probability of a person having investments in securities or real estate for retirement. Other studies I have examined, show that higher levels of financial literacy increase the probability that people think about retirement or participate in a voluntary pension fund (Almenberg & Säve-Söderbergh, 2011; Fornero & Monticone, 2011; Lusardi & Mitchell, 2011a; van Rooij, Lusardi & Alessie, 2011a; van Rooij, Lusardi & Alessie, 2011b).

I consider the limitations of my research to be the overrepresentation of those with a university education or higher and the methodology used to collect the surveys. In further research, an institution with more resources and a pandemic-free period can conduct broader and more representative research to measure possible improvements. As possible research in the future, I would suggest studying the effects of financial literacy on debt and decision making. Another research topic I would suggest would be how to improve the overall level of financial literacy in the country, as this is a challenge that needs to be addressed in the coming years.

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APPENDICES
Appendix 1: Povzetek (Summary in Slovene language)

Lahko trdimo, da sta bila od pojave prvega dokumentiranega pisnega jezika, ki se je pojavil v Mesopotamiji, in sicer med letoma 6000 in 5700 pred našim štetjem, pisni jezik in pismenost ena izmed najbolj pomembnih gradbenih elementov v razvoju sodobne družbe. V sedanji sodobni družbi ljudje vsak dan sprejemajo več in več odlocčitev, ki vplivajo na njihovo finančno blagostanje. Celo majhne odločitve se lahko dolgoročno negativno odražajo na finančno blagostanje če je oseba, ki sprejema te odločitve, naredila napako zaradi pomanjkanja znanja ali zaradi pomanjkanja dovolj zanesljivih informacij. (Lynch 2011). Veliko avtorjev verjamejo, da je za dobro odločitev, ko govorimo o teh zelo pomembhih aspektih življenja, potrebna drugačna vrsta pismenosti, in sicer finančna pismenost. Podobno definiranju pismenosti, kjer je Uneskova definicija le ena izmed mnogih, tudi o opredelitvi finančne pismenosti do zdaj ni bilo soglasja. Hung, Parker & Yoong (2011, str. 12) ponujajo definicijo o finančni pismenosti, ki temelji na prejšnjih raziskovalcih: "Finančna pismenost je poznavanje osnovnih ekonomskih in finančnih konceptov ter sposobnost uporabe tega znanja in drugih finančnih veščin za čimboljšo in učinkovitejšo upravljanje s finančnimi viri ter pridobitev finančne stabilnosti tekom celega življenja."

Medtem ko študije potrjujejo, da je finančna pismenost zelo pomembna, raziskave pokažejo, da je svetovna raven finančne pismenosti precej nizka. V raziskavi držav G20, ki jo je izvedla OECD, so imeli ljudje povprečno oceno 12,7 od največ 21 točk ali malo nad 60% (OECD, 2017). Klapper in sod. (2017) je opravil raziskavo na to temo v imenu bonitetnih služb Standard & Poor's in ugotovil, da je le 1 od 3 ljudi v povprečju finančno pismen. Raziskave iz preteklosti kažejo, da je finančna pismenost v Republiki S. Makedoniji nižja v primerjavi z ostalimi državami iz regije. V zgoraj omenjeni študiji, ki so jo izvedle bonitetne službe Standard & Poor's, ima Republika Severna Makedonija 21% finančno pismenih odraslih.

Glede na to, da so podatki iz drugih držav pokazali, da finančno pismeni ljudje bolj verjetno varčujejo in načrtujejo upokojitev, sem se odločil preizkusiti ali ta hipoteza velja tudi v Republiki Severni Makedoniji.

Glavni cilj te raziskave je oceniti raven finančne pismenosti ljudem, ki živijo v Republiki Makedoniji, in analizirati, kako se obnašajo v primerjavi z državami, v katerih so bile opravljene podobne raziskave Poleg tega bi rad raziskal ali finančna pismenost vpliva na to kako ljudje načrtujejo upokojitev in kako pripravljeni so ko dosežejo to stopnjo življenja

Vprašanja mojega magistrskega dela so:

- Kako finančno pismeni so državljani Republike Severne Makedonije?

- Kako (če sploh) finančna pismenost vpliva na pokojninsko načrtovanje v Republiki Severni Makedoniji?

Opravil sem anketo, ki je vsebovala 15 vprašanj, ki so mi pomagali izmeriti finančno pismenost v Republiki Severni Makedoniji. Zbral sem 746 odgovorov in sem 674 uporabil za nadaljnjo analizo. Po mojih raziskavah ima le 39% ljudi, ki živijo v severni Makedoniji, osnovno finančno pismenost, le 16% pa naprednejšo raven finančne pismenosti. Poleg tega sem naredil še multivariatno analizo in ugotovil, da finančna pismenost povečuje verjetnost, da ljudje že imajo investicije v svojo upokojitev ali bodo investirali v prihodnosti.

Appendix 2: Questionnaire in English language

Section I: Demographic questions

- 1. Please enter your gender.
 - Male
 - Female
- 2. Please choose the category that contains your age.
 - 18-24
 - 25-34
 - 35-44
 - 45-54
 - 55-65
- 3. Please enter the city you currently live in.
 - Bitola
 - Skopje
 - Kumanovo
 - Prilep
 - Ohrid
 - Tetovo
 - Shtip
 - Other city or rural area in the republic of North Macedonia
 - I live abroad
- 4. What is the highest level of education you have completed?
 - Primary education or lower
 - Secondary education
 - Bachelor's or equivalent level
 - Master's or equivalent level
 - Doctoral or equivalent level
- 5. Have you ever listened to a finance class or had any other finance education?
 - Never
 - I had a finance class in high school
 - I have a degree (or study) economics (undergraduate/master/doctorate)
 - I have had a workshop/online course/seminar or similar in finance
- 6. Please state your current employment status (multiple choice)
 - Employed, full time
 - Employed, part time
 - Freelancer
 - Unemployed
 - Student
- 7. Please chose your monthly income category.
 - I have no monthly income
 - Up to 15,000 MKD
 - 15,001 to 30,000 MKD
 - 30,001 to 50,000 MKD

- Over 50,000 MKD
- 8. Have you ever thought about retirement and how much?
 - Yes, I have thought about it a lot
 - I have given it some thought
 - Just a little
 - Hardly at all
 - Do not know
- 9. Do you participate in the third pillar of the pension system in the Republic of North Macedonia (voluntary contributions)?
 - Yes
 - No, but I plan to in the future
 - No
 - Do not know
- 10. Do you have any other investments or plan to make other investments for retirement (stocks, bonds, mutual funds, real estate etc.)?
 - I have other investments
 - I do not have other investments currently, but I will invest in the future
 - I think that the pension from the mandatory pension system will be enough
 - Do not know
- 11. Which of the following time periods is most important to you with regard to planning expenditures and savings?
 - The next couple of months
 - The next year
 - The next couple of years
 - The next 5-10 years
 - More than 10 years

Section II: Basic financial literacy questions

- 12. Suppose you had 1,000 MKD 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?
 - More than 1,020 MKD
 - Exactly 1,020 MKD
 - Less than 1,020 MKD
 - Do not know
- 13. Suppose you had 1,000 MKD in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have on this account in total?
 - More than 2,000 MKD
 - Exactly 2,000 MKD
 - Less than 2,000 MKD
 - Do not know

- 14. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?
 - More than today
 - Exactly the same
 - Less than today
 - Do not know
- 15. Assume Aleksandar inherits 100,000 MKD today and his brother, Stefan, inherits 100,000 MKD 3 years from now. Who is richer because of the inheritance?
 - Aleksandar
 - Stefan
 - They are equally rich
 - Do not know
- 16. Suppose that in 2021, your income will double. Prices of all goods will double too. In 2021, how much will you be able to buy with your income?
 - More than in 2020
 - The same
 - Less than in 2020
 - Do not know

Section III: Advanced financial literacy questions

17. Which of the following statements describes the main function of the stock market?

- The stock market helps to predict stock earnings
- The stock market results in an increase in the price of stocks
- The stock market brings people who want to buy stocks together with those who want to sell stocks
- None of the above
- Do not know
- 18. Which of the following statements is correct? If somebody buys the stock of firm B in the stock market:
 - He owns a part of firm B
 - He has lent money to firm B
 - He is liable for firm B's debts
 - None of the above
 - Do not know
- 19. Which of the following statements is correct?
 - Once one invests in a mutual fund, one cannot withdraw the money in the first year

- Mutual funds can invest in several assets, for example invest in both stocks and bonds
- Mutual funds pay a guaranteed rate of return which depends on their past performance
- None of the above
- Do not know
- 20. What happens if somebody buys a bond of firm B?
 - He owns a part of firm B
 - He has lent money to firm B
 - He is liable for firm B's debts
 - None of the above
 - Do not know
- 21. Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return?
 - Savings accounts
 - Bonds
 - Stocks
 - Do not know
- 22. When an investor spreads his money among different assets, does the risk of losing money:
 - Increase
 - Decrease
 - Stay the same
 - Do not know
- 23. If you buy a 10-year bond, it means you cannot sell it after 5 years without incurring a major penalty. True or false?
 - True
 - False
 - Do not know
- 24. Stocks are normally riskier than bonds. True or false?
 - True
 - False
 - Do not know
- 25. Buying a company stock usually provides a safer return than a stock mutual fund. True or false?
 - True
 - False
 - Do not know

26. If the interest rate falls, what should happen to bond prices?

- Rise
- Fall
- Stay the same
- None of the above
- Do not know
- 27. How would you assess your own understanding of economics and finance (please chose from a scale from 1 to 7 where 1 means very low, and 7 means very high)?

Appendix 3: Questionnaire in Macedonian language

Секција I: Општи прашања

- 1. Пол на испитаникот
 - Машки
 - Женски
- 2. Возраст
 - 18-24
 - 25-34
 - 35-44
 - 45-54
 - 55-65
- 3. Одберете го градот во кој живеете.
 - Битола
 - Скопје
 - Куманово
 - Прилеп
 - Охрид
 - Тетово
 - Штип
 - Друг град или село во Република Северна Македонија
 - Живеам надвор од државата
- 4. Највисок степен на завршено образование
 - Основно образование или пониско
 - Средно образование
 - Високо образование
 - Магистер
 - Доктор на науки
- 5. Дали некогаш сте имале предмет во Вашето образование или сте присуствувале на предавање за финансии??
 - Никогаш
 - Сум имал/а предавање за финансии во средно
 - Сум имал/а курс/работилница/семинар или слично за финансии
 - Имам диплома или студирам на економски факултет (додипломски/постдипломски/докторски студии)
- 6. Ве молам внесете го Вашиот работен статус
 - Вработен/а, полно работно време
 - Вработен/а, пола работно време
 - Хонорарец
 - Невработен/а
 - Студент
- 7. Ве молам, одберете во која категорија на месечни примања припаѓате:
 - Немам месечни приходи
 - До 15,000 денари

- 15,001 до 30,000 денари
- 30,001 до 50,000 денари
- Над 50,000 денари
- 8. Дали сте размислувале за Вашата финансиска состојба по пензионирањето?
 - Да, често сум размислувал/а
 - Да, сум размислувал/а
 - Само малку
 - Воопшто не сум размислувал
 - Не знам
- 9. Дали учествувате во третиот столб (доброволна уплата) на пензискиот систем на Р. Македонија?
 - Да
 - Не, но планирам во иднина
 - He
 - Не знам
- 10. Дали имате некои други инвестиции или планирате да инвестирате во иднина за да имате дополнителен приход по Вашето пензионирање (акции, обврзници, недвижнини, инвестициски фондови)?
 - Да имам дополнителни инвестиции
 - Не, немам во моментот, меѓутоа планирам да инвестирам во иднина
 - Не, мислам дека пензијата ќе ми биде доволен приход
 - Не знам
- 11. Колку долг временски период е од најголема важност при планирањето на Вашите трошоци и штедење?
 - Наредните неколку месеци
 - Наредната година
 - Наредните неколку години
 - Наредните 5-10 Години
 - Повеќе од 10 години

Секција II: Основни прашања од областа на финансии

- 12. Претпоставете дека имате 1,000 денари на штедна сметка во банка и каматната стапка е 2% на годишно ниво. Доколку воопшто не подигнете пари од Вашата сметка, колку би имале на сметката по 5 години?
 - Повеќе од 1,020 денари
 - Точно 1,020 денари
 - Помалку 1,020 денари
 - Не знам
- 13. Претпоставете дека имате 1,000 денари на штедна сметка во банка и каматната стапка е 20% на годишно ниво. Доколку воопшто не подигнете пари од Вашата сметка, колку би имале на сметката по 5 години?
 - Повеќе од 2,000 денари
 - Точно 2,000 денари
 - Помалку од 2,000 денари

- Не знам
- 14. Претпоставете дека каматната стапка на вашата штедна сметка во банка е 1% на годишно ниво, а годишната инфлација е 2%. По една година, колку производи ќе можете да купите со парите од Вашата сметка??
 - Повеќе од денес
 - Исто колку денес
 - Помалку од денес
 - Не знам
- 15. Претпоставете дека Александар денес добил наследство од 100,000 денари, а неговиот брат Стефан ќе добие наследство од 100,000 денари по 3 години. Кој е побогат поради добиеното наследството?
 - Александар
 - Стефан
 - Никој, двајцата добија еднакво
 - Не знам
- 16. Претпоставете дека Вашите примања во 2021 година ќе бидат двојно поголеми од 2020 година. Цените на сите производи ќе бидат двојно поголеми исто така. Колку производи ќе можете да купите со Вашите примања во 2021 година?
 - Повеќе од 2020
 - Исто колку во 2020
 - Помалку од 2020
 - Не знам

Секција III: Поконкретни прашања од областа на финансии

- 17. Која од следните изјави најдобро ја опишува главната функција на берзата (пазарот на акции)?
 - Берзата помага да се предвиди очекуваниот профит од акциите
 - Берзата ја зголемува цената на акциите
 - Берзата е посредник помеѓу луѓето кои што сакаат да купат акции и оние кои што сакаат да продадат акции
 - Ниедно од горенаведените
 - Не знам
- 18. Која од следните изјави е точна? Доколку купите акции од фирмата "Б", Вие:
 - Сте сопственик на дел од фирмата "Б"
 - Позајмивте пари на фирмата "Б"
 - Сте одговорни за долгот на фирмата "Б"
 - Ниедно од горенаведените
 - Не знам

- 19. Која од следните изјави е точна?
 - Доколку инвестирате во инвестициски фонд, не можете да ги повлечете парите во првата година
 - Инвестициските фондови можат да инвестираат во различни хартии од вредност, на пример акции и обврзници
 - Инвестициските фондови плаќаат гарантирана стапка на добивка која зависи од успехот во минатите години
 - Ниедно од горенаведените
 - Не знам
- 20. Која од следните изјави е точна? Доколку купите обврзници од фирмата "Б" Вие:
 - Сте сопственик на дел од фирмата "Б"
 - Позајмивте пари на фирмата "Б"
 - Сте одговорни за долгот на фирмата "Б"
 - Ниедно од горенаведените
 - Не знам
- 21. За инвестиции на долг рок (на пример, 10 или 20 години), кое од следните средства би донело највисок профит:
 - Штедна сметка во банка
 - Обврзници
 - Акции
 - Не знам
- 22. Доколку инвестирате во повеќе различни средства (акции, обврзници и сл.) Вашиот ризик од загуба:
 - Се зголемува
 - Се намалува
 - Останува ист
 - Не знам
- 23. Доколку купите 10 годишна обврзница тоа значи дека не можете да ја продадете по 5 години без да претрпите загуба?
 - Точно
 - Неточно
 - Не знам
- 24. Акциите се најчесто поризични од обврзници. Точно или Неточно?
 - Точно
 - Неточно
 - Не знам

- 25. Купување на акции од една компанија најчесто обезбедува посигурен профит од инвестирање во инвестициски фонд. Точно или Неточно?
 - Точно
 - Неточно
 - Не знам
- 26. Доколку пазарната каматна стапка се намали, што се случува со цените на обврзниците?
 - Ќе се зголемат
 - Ќе се намалат
 - Ќе останат исти
 - Ниедно од горенаведените
 - Не знам
- 27. Како би го оцениле Вашето знаење и разбирање за економија и финансии? Ве молам, одберете на скала од 1 до 7 каде 1 означува најниско, а 7 означува највисоко.