
Students' Attitudes Towards Savings and Investment: The Case of Poland

Submitted 11/09/20, 1st revision 13/10/20, 2nd revision 06/11/20, accepted 30/11/20

Magdalena Osińska¹ Kinga Wasilewska^{2,3}

Abstract:

Purpose: The purpose of the paper is to identify students' attitudes in Poland towards saving and investment and evaluate determinants that influence the probability of accumulating funds and subjective satisfaction of financial results.

Design/Methodology/Approach: The analysis was conducted using survey data collected in August 2018. Over 400 questionnaires were collected from Polish students using CAVI method. The structure of the sample corresponds to the target sample of students reported in another research. Statistical methods of analysis are used, i.e., analysis of empirical distribution and its characteristics and correlation measures. Logit regression models for microdata are used to evaluate the impact of factors that determine the probability of saving and investing money.

Findings: In the sample, most students were fully aware that savings are important. However, the amount of money they were able to save is not big. Due to the liquidity preference, students typically keep money in ready cash and bank accounts. The factors determining propensity to save, propensity to invest and subjective satisfaction from savings have been specified.

Practical Implications: The research results are useful for comparisons with other reports on savings and investment. They are useful for financial institutions policy creation and financial education.

Originality/Value: This research's value lies in the original survey prepared under the supervision of a financial institution and applying the advanced econometric methodology.

JEL Classification: C25, D12, D14.

Keywords: Savings, life-cycle theory, generations Y and Z, distribution, Logit model.

Paper type: Research study.

¹Corresponding author, Nicolaus Copernicus University in Torun, Poland, ORCID ID: orcid.org/0000-0002-9796-2892, e-mail: emo@umk.pl,

²University of Gdansk, Poland, ORCID ID: orcid.org/0000-0002-6323-7158, e-mail: kinga.wasilewskaa@gmail.com

³The author gratefully acknowledge that this paper's data were collected during a student internship in one of distribution companies that offers investment funds participation units. The data were not used elsewhere.

1. Introduction

The attitudes of young generations (particularly technology generations defined as Y and Z) toward finance and investment are diversified across countries. However, some similarities can be found no matter what region they live in. For example, both generations spend much money for today, although Zs are perceived as a generation who tends to save, while Ys typically do not care about their savings (Bencsik *et al.*, 2016). Traynor (2015) demonstrated preferences of making savings by these generations. House, travel, and further education are highly preferred, while retirement or having children have low preferences. Further study of the literature shows that most young people represent a low level of financial knowledge and skills, though they are well-equipped in technological devices and skills (Musiał and Świecka, 2016).

It is worth noting that together with a high technological development of accessible devices and applications, an incremental change in financial markets has been observed since the 2000s. The modern financial system is characterized by a high pace of innovations, which results in their heterogeneity and complexity (Błach, 2011). Such state of the art does not facilitate individual recognition in financial instruments, their advantages, disadvantages, and accessibility for a young person. Furthermore, according to the life-cycle theory, young people exhibit a larger marginal propensity to consume than other groups (Shefrin and Thaler, 1988).

This research aims to examine students' attitudes in Poland towards savings and investment considering many financial products. Furthermore, the attention is focused on exploring determinants that support their propensity to save and invest and subjective satisfaction from gathered funds. The data were collected in August 2018 *via* an internet questionnaire directed to students. Statistical analysis, Pearson's chi-square test, and econometric logit models are used to provide measurable results. This paper is structured as follows. The first section brings a review of recent literature in the field of savings and investment. The second section presents the economic background related to the life-cycle hypothesis. The third section presents the research hypothesis and the methodology applied. In the fourth section, the empirical results of our study are presented and discussed. In the last section, we conclude.

2. Literature Review

The trade-off between savings and consumption is important across abundant economic literature. To start the literature review it is necessary to present the main characteristics of the young generations, *i.e.*, the generation Y and generation Z. Students surveyed in the study are representatives of two generations – generation Y (also known as millennials) and Z (also called: iGeneration, Facebook generation or digital natives). There is no strict time-categorization of them, and researchers use different divisions of dates to describe each generation type (Bencsik *et al.*, 2016). For this article, the authors adopted time-categorization proposed by Zemke *et al.* (2000),

according to which millennials were born in the years 1980 - 1995 and digital natives in 1995 – 2010, respectively. What is repeatable across the literature is the fact that those generation types diverge in many aspects. The most important for them are those presented in Table 1.

Table 1. *Differences between Y and Z generations*

Generation Y	Generation Z
Growing up in the age of technology, personal computers, and the beginning of the Internet - have very good knowledge of it	Born in the age of technology, video streaming, faster internet - always online
Success-oriented - career and money are their prime concerns	Living for today, satisfied with what they own
At work focused on competition and self-development	At work rather not committed, with lack of desire to make significant things
Spend a lot of money on comforts and convenience (restaurants, clothes, Ubers)	Spend money mostly on food
While buying, they are more focused on the whole experience of purchasing a product, rather than on money spent	While buying they want to get the best value for their money
Spend a lot of money easily; a significant number of their representatives do not make any savings	Careful about spending money, 'generation of savers'
Their priority is to possess sufficient money for everyday life, spend them on bills and comfortable day-to-day being without much thinking about their future	More entrepreneurial; housing for them is a source of income not only a place for living; they know what investments are and start to invest; learning on elderlies mistakes - they want to make best value for their money
Most of them have some money collected for the retirement, but savings is not their priority	Have potential to be well-prepared for their retirement – thanks to investing money at the young age

Source: *Own elaboration based on: Bencsik et al. (2016), Fong et al. (2019); Traynor (2015); <https://www.salesforce.com/blog/2017/10/how-millennials-and-gen-z-are-different.html>; <https://www.forbes.com/sites/forbesbooksauthors/2019/05/01/millennial-spending-habits-and-why-they-buy>; Millennials and Retirement 2020 – understanding, saving and planning; Generation Z on Track Toward Retirement Success – executive summary (2017).*

In general, the subject literature can be classified into two groups: the first - general research concerning savings and investment in one or many countries, and the second is research which emphasizes attitudes of the young generation towards savings, investment, and retirement.

The first approach is represented by Frączek (2012). She analyzed the factors that have an impact on the decision of choosing between consumption and saving. The author presented yearly savings rates of households from different countries, *i.e.*, Great Britain, USA, Spain, or Slovakia, and mentioned the factors that have an impact on them, such as, for instance, revenue, national taxation policy, unemployment rate,

demographic factors like profession or age. Frączek mentioned that young people understate the savings rates of households, whereas older people accumulate them. Żmudzińska (2016) carried out a study amongst Polish people over 25 years old about their systematic and long-term saving attitude. The research showed that most investigated people (69%) do not save money, not even a small amount. Those who make savings (72%) mostly keep them in their bank accounts, whereas only 2% keep their money at home. The author mentioned that the chosen type of long-term saving depends on how much money people have and how long they want to save it. Dębski and Świdorski (2016) analyzed the dynamics and allocation of Polish household savings invested in financial assets in 2003-2014. The study showed that along with the improvement of Poland's economic conditions, the proportion of personal savings allocated to shares and mutual funds increased, and the proportion of savings allocated to deposits and debt securities decreased.

However, after the global financial crisis in 2007-2008, the proportions discussed above displayed in adverse economic circumstances. Similar analyses for the U.K., the U.S., and Italy are presented by Kirsanova and Sefton (2007). Brennan and Xia (2002) developed a framework for analyzing a finite-horizon investor's asset allocation problem under-inflation when only nominal assets are available. When short positions are precluded, they found that the optimal strategy consists of investments in cash, equity, and a single nominal bond with optimally chosen maturity. The optimal stock-bond mix and the optimal bond maturity depend on the investor's horizon and risk aversion. Walczak and Pieńkowska-Kamieniecka (2018) investigated financial behaviors according to gender. Estimating a set of logit models, they found out that men are more active in investment in investment funds and shares or bonds.

Some of the researchers focused only on young people as a target group. Pettigrew *et al.* (2007) documented the outcomes of research done in 2007 by the MORI Institute on behalf of the Department for Work and Pensions in the U.K. To recognize the attitudes of young people (between 16 and 29 years old) towards saving, qualitative research was performed. It was divided into two parts: discussion groups and face-to-face interviews with people chosen during the first part. The findings showed that young adults agree that saving money in the long- and short-term is essential and should be made. Even though some of them responded that they do not save, they practice keeping money in one place to pay their bills later. In fact, according to the study results, young people perceive savers as mean people. The majority of them also do not think about funding their retirement because, as they say, they 'live for today'.

Dophin (2012) asked young people about saving using a survey in which over 1,500 participants aged 16-29 took part and organized workshops deliberately in Great Britain. According to the study, most young people do not feel financial security: 25% of them do not have any savings, whereas less than 10% gathered no more than 100 pounds. Some explained that it is an elusive target for them to save much money. More recent research on the young generation's savings is presented by Swadźba (2017).

The author carried out auditorium questionnaires amongst a group of more than 1,500 students from the Visegrad Group (V4). The study showed that the young generation of V4 is relatively abstemious in spending money. However, according to Hungarian students, it is important to spend much money to impress people. Polish, Czech, or Slovak students do not attach such importance to money. Students in the U.K. and in Finland were also examined by Hietanen (2017). The study showed that 46% of Finnish students invested in financial markets, whereas almost 90% of British students did not. Furthermore, their opinion about investing is not as positive as that of Finnish students who tolerate risk and choose different ways of investing money. It was also revealed that almost 90% of British students were encouraged to invest, but they still are not ready for this step. Finnish students were not encouraged as many times, but they are likely to invest their money in bank deposits, stocks, or mutual funds.

3. The Life-Cycle Theory of Consumption

In economic literature, two hypotheses concerning consumption are most recognized. These are the Absolute Income Hypothesis (AIH) proposed by Keynes (1936) and Permanent Income Hypothesis (PIH) authored by Friedman (1957). The first assumes that the marginal propensity to consume is smaller than one, so a certain amount of money can be saved. Friedman (1957) noticed that income changes over time to not be the primary determinant of consumption. Typically, people plan their expenses based on this part of income that is stable. Thus, he proposed the permanent income hypothesis.

An alternative for the two aforementioned hypotheses for aggregate consumption is the life-cycle theory (Modigliani, 1966). He observed that people make consumption decisions based on resources available to them over their lifetime and current life stages. He observed that individuals build up assets at the initial stages of their working lives. When they got retired, they make use of the accumulated stock of assets. While working, people save money and wealth (for example, real estate, company shares, and so on) conditionally for a stage of their life. Thus, typically young people who start their adult life start to save, but their savings are rather modest. Expenses for consumption start growing when a young couple decides to have children and buy a house or flat, and they continue to grow together with growing children. When children finally leave their family house, the expenses of their parents are reduced. They accumulate more than before and try to make savings for the time of retirement. The life-cycle hypothesis assumes a certain length of life. Typically, it is announced by statistical services for a given region.

Modigliani's model was defined as follows. Let us assume that a consumer expects to live for another T years and has a wealth of W . The consumer also expects to annually earn income Y until he retires R years from now. In this situation, the consumer's resources over his life consist of his initial wealth endowment, W , and his lifetime earnings, $R*Y$. The consumer can distribute his lifetime resources over the remaining

T years of his life. It is assumed that he divides $W + R*Y$ equally among T years, and in each year, he consumes:

$$C = \frac{W+R*Y}{T}$$

The consumption function of this person can be written as

$$C = \frac{1}{T}W + \frac{R}{T}Y$$

If every individual in the economy plans consumption in this manner, then the aggregate consumption function will be quite similar to the individual one. Thus, the aggregate consumption function of the economy is:

$$C = aW + bY$$

where a is the marginal propensity to consume for wealth and b is the marginal propensity to consume for income.

Although the life-cycle theory was formulated in the 1950s, it is still considered both theoretically (Deaton, 2005) and empirically (Bai and Whitney, 1996). Bayar and McMorrow (1999) point out that Modigliani's model does not care for money value in time and alternative investment. Thaler and Shefrin (1988) emphasized that the permanent income is not well approximated by current income for young people on the long-time horizon. According to the permanent income hypothesis, income elasticity of demand equals 1 when permanent income equals current income. The income elasticity of the young's consumption is higher than one since the current income is lower than the permanent income.

From the perspective of this research, three important aspects are to be emphasized. Firstly, we focus on students who are just starting their professional careers, so their savings are at the beginning of accumulation. There are relatively short-term savings for consumption in the nearest future (for example, for vacations or expenses related to health and wellness). Secondly, the interest rate is not included directly in the research. However, it is present indirectly *via* ways of keeping savings (from mostly liquid like cash to the least liquid, like real estate). Finally, this section's economic background must be related to aggregate consumption, and we focus on microdata collected from the survey. That is why we refer to the life-cycle hypothesis to place the empirical results in the right framework.

4. Survey Characteristics and Methodology

The target group, i.e., students, was widely characterized in PBS's report (www.eurostudent.eu) for the Ministry of Science and Higher Education in Poland in 2018. Based on that report, we recognized that the most popular study programs

concentrated around business, administration, and law (23%), the next popular group was technology, industry, and construction (20%), and social sciences, journalism, and social information was on the third place (12%). Poland's students are relatively young, as 79% are below 25 years old, and only 9% are above 30 years old. The median age equals 23 years. As concerns gender, women's domination is observed since 59% of students taking part in the reported survey were women, and 41% were men. Referring to students' economic situation in Poland, it was reported that the average income from all possible sources amounted to 2,095.8 PLN (that corresponds to 471 Euro).

The present study aimed to find out about the attitudes of the students towards saving and investing. A research hypothesis was formulated that students prefer saving to investing due to a low disposable income level.

The research was carried out in August 2018 through an online questionnaire – using the CAVI method. It consisted of thirty-one both open and closed questions. Filter questions preceded some parts of the questionnaire. The questions were formulated in different forms. Four of them were formulated to obtain dichotomous answers (yes or not). The majority of questions represented preferences according to the five-level Likert scale (McLeod, 2019). There are also some quantitative questions. Several questions were completed by explaining the reasons.

The questionnaire was posted on students' online groups, such as university groups and social media from all over the country. The respondents who decided to answer the questions came from a homogenous group of students aged 18-31 and came from different regions. There were 533 answers gathered in total. However, 433 of them were taken into consideration during this analysis (the rest was incomplete). The sample size is large; therefore, it became a basis for exploratory analysis (Fricker, 2008).

The first glance methodology for survey data is related to descriptive analysis and empirical distributions of the individual answers, which are collected as microdata. They reveal the frequency of answers related to the possible variants. Other necessary measures are related to correlation analysis. The answers can be categorized into the following three groups: nominal data, ordinal data, and quantitative data. Such a variety of measurement scales allow using only methods available at weaker scales (Wiśniewski, 2016 p. 15). In the research reported, Pearson's chi-square test for independence of two variables is applied (Bolboacă *et al.* 2011). It refers to one population, and it is assumed that each population is at least ten times as large as its respective sample (Li and Doss, 1993). The null hypothesis is that there is no association between two variables, which means the two variables are independent. Looking for relationships, we ask the question of whether it is possible to reject the null. The test has the following formula:

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

where χ^2 - value of Chi-square statistics, O_i - denotes observed frequency associated with the i -th frequency class and E_i denotes expected frequency calculated from the theoretical distribution law for the i -th frequency class (Bolboacă *et al.* 2011).

The logit model is a useful construction that allows estimating the impact of determinants that support one of two variants of the defined variable. In the reported research, dependent variables are constructed as binary to ensure estimating the probability, supporting, or not supporting an answer yes=1. Thus, the endogenous variable takes the form:

$$Y_i = \begin{cases} 1, & \text{when the answer is yes with probability } p \\ 0, & \text{otherwise (with probability } 1-p) \end{cases} \quad (1)$$

The linear model takes the following form:

$$Y_i = \alpha_0 + \sum_{k=1}^K \alpha_k X_{ki} + \varepsilon_i \quad (2)$$

As the endogenous variable has only two variants and exogenous variables are both numerical and binary, it is necessary to transform the model to obtain consistent estimates. One of the useful transformations is logit transformation (Cameron and Trivedi, 2008, p. 469). Let p denote the probability of a given variant of the defined variable Y conditionally on given values of exogenous variables. Then, we transform probability from the interval (0;1) into logit values from the interval $(-\infty, +\infty)$ using

$$L = \ln \frac{p}{1-p} \quad (3)$$

The transformed model takes the following form:

$$L_i = \alpha_0 + \sum_{k=1}^K \alpha_k X_{ki} + \varepsilon_i \quad (4)$$

To find a value of probability p the following transformation is applied (Wiśniewski, 2016 p. 37):

$$p = \frac{1}{1 + \exp \left[- \left(\alpha_0 + \sum_{k=1}^K \alpha_k X_{ki} \right) \right]} \quad (5)$$

Parameters of model 4 are estimated using the maximum likelihood method. To evaluate the model goodness-of-fit pseudo-R² by McFadden (McFadden, 1974) and the ratio of predicted outcomes (Cameron and Trivedi, 2008, p. 474) are applied. Parameters of the logit model inform about supporting or negating a probability of gaining the value of one in (1). At the same time, slope parameters are estimated, which are interpreted as marginal effects of exogenous variables on this probability.

5. Empirical Results

The empirical results are divided into two parts. The first one is based on a simple statistical analysis of distributions and pairwise relationships between selected variables. The second part reports estimated logit models and some more general conclusions.

5.1 Statistical Analysis of Data

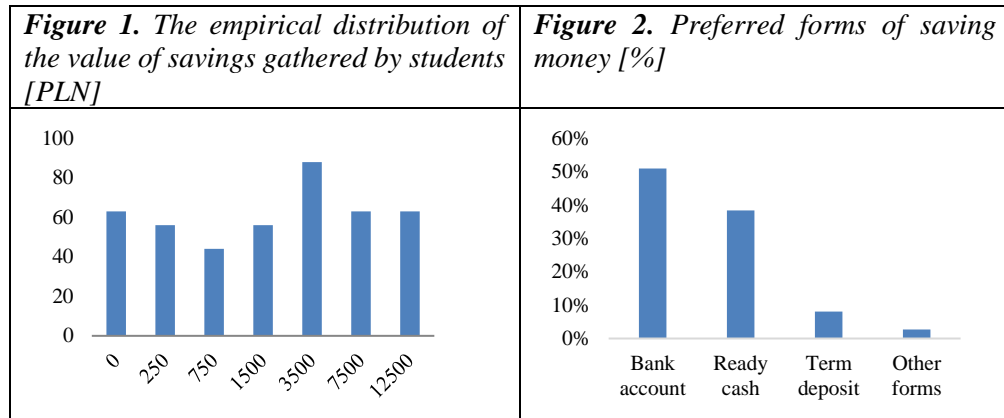
The detailed information about the structure of the sample is presented in Table 2. It is worth noting that the structure of age and degree course confirm the structure presented in the www.eurostudent.eu. As concerns gender, a much higher ratio of women is observed. Additional indicators are a place of residence and saving money. They help justifying the structure of the sample as corresponding to the target population described in previous section.

Table 2. *A structure of the research sample [%]*

Characteristics	Fraction	Characteristics	Fraction	Characteristics	Fraction
Gender		Place of residence		Degree course	
Female	82	Village	21.7	Related to economics	28
Male	18	City of population < 25,000	8	Unrelated to economics	72
Age		City of population 25,000 - 100,000	15.5	Save money	
18-21	55	City of population 100,000 – 250,000	15	Yes	85.5
22-25	39	City of population 250,000 – 500,000	10.2	No	14.5
26-32	6	City of population >500,000	29.6		

Source: Own study.

Having analyzed the structure of the responses for the questionnaire, distributions of two variables are worth considering. The distribution of savings in PLN is presented in Figure 1 and preferred forms of saving in Figure 2.



Source: Own study.

According to runs test (Pham, 2007) it can be considered as random (p-value 0.628). Among 433 persons, only 63 had more than 10,000 PLN, and 63 documented no savings. The mode equals 3,500 PLN, which means that the interval between 2,000 and 5,000 was the most frequently selected.

However, the median's value is 1,500 PLN, which means that 50% of students under investigation amounted savings below or at most this value (the corresponding interval was 1,000 - 2,000 PLN). It can be essential to note that the minimum wage in Poland in 2018 was 2,100 PLN total (1,598 PLN after tax), while the average salary was 4,900 PLN total, which gives around 3,530 PLN after tax (see: <https://polandunraveled.com/average-salary-in-poland/>). The research results showed that most students are somewhat satisfied with their savings, but 17% of respondents are not pleased with the amount of money they have collected. As the main reasons for the exiguous satisfaction, they indicate the following: the willingness to save more money, the feeling that they spend too much, irregularity in making savings or the lack of work, money, and savings deficiency.

Students were also asked to provide information about the preferred form of collecting their money. The data is summarized in Figure 2. Over 50% of students surveyed keep their money in bank accounts. More than 1/3 of all respondents prefer ready cash, whereas almost one in ten saves their money by keeping it a term deposit. The rest (a group of 2.7%) selects other forms of saving money, such as shares, bonds, cryptocurrencies, investment funds, or real estate. Respondents often mentioned a significant increase in their living costs when they moved from family houses to bigger towns to study and live independently—only three people out of 433 used investment funds. Respondents justified the reasons for their preferences.

Collecting money in a bank account or a proverbial 'sock' (the most popular option among students) is mostly preferred because of accessibility, liquidity, and the lack of risk. The study also revealed why students make savings. Those who save money indicated as their reasons: the need of having money for 'a rainy day' (43.4%), consumerism (26.2%), or the sense of financial independence (24.9%). They also named forms of making savings that they perceive as the most attractive. The property, ready cash, and bank accounts seem to them as the most appealing ones.

Interestingly, while they store money in bank accounts or keep ready cash, they do not own properties but owning something seems attractive to them, even though - now, because of the lack of work or small scholarship - they cannot afford to buy a house. It seems like a goal for the future. Respondents also indicated the least attractive forms of making savings to them, for instance: cryptocurrencies, retirement funds (which confirms the assumption that generations studied keep living day-to-day), and *via* Revolut cashback system. Special attention was paid to the student's knowledge about investment funds and their perception of them.

According to the study, 76% of interviewees know what investment funds are and mostly associate them with investing (17.5%), profit (9.9%), risk (9%), money (5.3%), and saving (5%). Even though students know what investment funds are and have accurate associations related to them, over 75% do not think that they are for them and would not like to try this form of investing. As the reasons, they indicate the lack of knowledge about investment funds (37%), too much risk connected with investing (13%), or just the preference of other forms of saving money (8.5%). Respondents were also asked what would encourage them to purchase investment funds shares. They indicated, for instance, a low price for entry (37.4%), the chance of higher profits than while using other forms of saving (33.9%) or previous financial results (33.5%).

According to the research, students do not think a lot about their retirement because they feel too young for this (only 19.4% answered positively). They also claim that they do not have work, money or at the moment have other more relevant expenditures. Some of the respondents answered that they are unsure if they will live to see their retirement, which illustrates their attitude towards day-to-day life.

To detect empirical relations between the selected variables, we based on the Chi-square test of independence. The results are presented in Table 3. In the table presented in the annex, names of the variables are explained.

Table 3. *The relationships between selected variables based on the Chi-square test of independence (significance level 0.05)*

Variable name	Chi-square test - p value	Decision
Y3 – Z19	0.049	H0 rejected; related
Y3 – Z4	1.4e-035	H0 rejected; related
Y3 – Z1	1.6e-040	H0 rejected; related
Y3 – Z2	1.3e-040	H0 rejected; related

Y3 – Y2	0.305	H0 not rejected; not related
Y2 – Z4	0.212	H0 not rejected; not related
Y2 – Z2	0.802	H0 not rejected; not related
Z1 – Z22	0.292	H0 not rejected; not related
Z16 – Z2	0.368	H0 not rejected; not related
Z2 – Z4	1.1e-085	H0 rejected; related
Z4 – Z19	0.001	H0 rejected; related

Source: Own study.

Satisfaction resulting from saving is related to such characteristics as gender, making savings, the value of savings gathered in PLN, and the preferred form of saving (from the most liquid to the least liquid). Making saving is not related to the field of studies, *i.e.*, students of business, economics, and finance do not save more frequently than the others. Investment is related neither to satisfaction from savings nor to the value of savings. It should be definitely linked with a low value of capital possessed and saved by students, liquidity preference, and low interest in investment. However, the value of savings is related to the preferred form of savings. Further preferred forms of savings are related to gender, which may indirectly support differences between men and women in risk perception.

5.2 Empirical Logit Models

Research-based on logit models is planned sequentially. The sequence of models is as follows: model (1) to determine factors influencing students' propensity to save; model (2) to detect factors of propensity to invest money and model (3) to indicate determinants of subjective satisfaction with hitherto gained financial results. According to the life-cycle theory, the logic of such an approach stems from a sequence of putting off savings. The set of endogenous and exogenous variables considered in the models are fully described in the annex. In the sample, a proportion of persons who positively responded to whether they should save some money when studying equalled to 95% because only 23 people of 433 answered negatively. To evaluate the determinants of the probability of propensity to save, a logit model (1) was constructed. The dependent variable is defined as the propensity to save: Y1 (binary) 'do you think that students should save money' where yes = 1 and no = 0. It is worth noting that to obtain a binary variable, the answers: 'definitely yes' and 'probably yes' were qualified as one, and the answers 'definitely no' and 'probably no' were qualified as 0. The result of the final estimation is presented in Table 4.

Table 4. Empirical logit model for propensity to save (model 1)

Variable	Coef. estimate	Std. error	Z	Slope
const	2.819	0.875	3.221	
Z1	1.988	0.619	3.211	0.051
Y3	2.296	0.859	2.673	0.049
Z7	-0.456	0.208	-2.193	-0.005
Z10	1.728	0.743	2.326	0.014

Z21	-0.245	0.134	-1.829	-0.003
Model diagnostics				
McFadden R2	0.342	Likelihood ratio test (chi5)	61.411 [0.000]	
Loglikelihood	-59.183	AIC	130.366	
S.C.	154.790	Correct prediction ratio	94.7%	

Source: Own study.

As all exogenous variables are statistically significant, we present a marginal effect for each variable in the table. The results show three stimulants and two de-stimulants for propensity to save money among students. The following variables exhibit a positive impact on the probability of saving: a decision of saving money, satisfaction from hitherto savings, and considering saving into investment funds. The negative impact on the probability of saving comes from the preference to buy shares and the place of residence. The last variable is easy to explain, since the bigger the city, the higher costs of living. It shows that having a rather low monthly income is hard to save money as students often have. Buying shares was preferred by 30.2% of respondents, but often the amount of money does not allow investing in companies' shares due to its small value. Model diagnostics is entirely satisfactory. McFadden pseudo-R² is equal to 0.342, and the correct ratio of 1s and 0s equals 94.7%.

In model (2), the question was whether young adults prefer to invest their money, considering the risk of losing the initial value of their capital. The endogenous variable was approximated using those answers that declared using shares, bonds, real estates, investment funds, pension funds, and metals as the preferred investment way. To construct Y2 as a binary variable, the answers presented at the Likert scale, which indicated 4 or 5 were taken as 1 (strong preference), while answers from 1 to 3 were taken as 0 (weak preference). The number of 1s was 138 and the number of 0s was 295. The results of the estimation are presented in Table 5.

Table 5. *Empirical logit model for propensity to invest (model 2)*

Variable	Coef. estimate	Std. error	z	Slope
Const	-14.611	1.672	-8.738	
Z7	1.139	0.212	5.371	0.059
Z8	0.468	0.161	2.899	0.024
Z9	0.882	0.178	4.951	0.046
Z10	0.787	0.143	5.489	0.041
Z12	0.797	0.148	5.370	0.042
Z14	-0.525	0.139	-3.758	-0.027
Z15	0.689	0.135	5.096	0.036
Model diagnostics				
McFadden R2	0.631	Likelihood ratio test (chi7)	342.159 [0.0000]	
Log likelihood	-99.931	AIC	215.862	
S.C.	248.427	Correct prediction ratio	90.1%	

Source: Own study.

The set of factors determining the probability of investing among students comprises preferring particular financial instruments such as shares, bonds, real estates, investment funds, pension funds, Revolut cashback system, and metals (particularly gold). All these instruments, apart from Revolut cashback system, support the probability of investing among students. Model diagnostics show a high level of goodness-to-fit measures. McFadden pseudo- R^2 is equal to 0.631, and the correct ratio of 1s and 0s equals 90.1%.

The final model summarizes subjective satisfaction from the results of savings (Model 3). Students were asked whether they are satisfied with the results of their savings (1= yes; 0 = no). The number of 1s was 306 and the number of 0s was 127. The result of the estimation is presented in Table 6.

Table 6. Empirical logit model for determinants of satisfaction from the results of saving (model 3)

Variable	Coef. estimate	Std. error	Z	Slope
Const	-2.972	1.738	-1.710	
Y1	3.445	1.033	3.334	0.692
Z2	0.0002	5.1e-05	4.651	3.9e-05
Z3	0.535	0.286	1.869	0.088
Z4	1.711	0.314	5.441	0.283
Z5	0.641	0.128	4.989	0.106
Z6	-0.210	0.112	-1.873	-0.035
Z13	0.272	0.107	2.545	0.045
Z19	-0.660	0.380	-1.737	-0.122
Z20	-0.231	0.064	-3.619	-0.038
Model diagnostics				
McFadden R2		0.418	Likelihood ratio test (chi9)	219.32 [0.000]
Log likelihood		-152.339	AIC	324.678
S.C.		365.385	Correct prediction ratio	86.8%

Source: Own study.

The factors decreasing subjective satisfaction from savings are as follows: the preference of a bank account, gender, and age. The first is that bank accounts do not pay any interest rate or payment is very limited and low. It is similar to cash, but cash can be considered as a mostly liquid form of savings. Gender (1=man) has a negative impact because men are dissatisfied with their savings more often than women. Finally, the age factor also has a negative impact on the probability of satisfaction from savings. So, the older the person is than the satisfaction from savings is lower.

The causes of such state of the art can be different; one of the possible explanations given in the questionnaire is the difference between the expected and actual value of accumulated savings: the higher expectations, the lower satisfaction. The highest slope value is assigned to 'the preferred form of saving' whose distribution is given in Figure 2. It means that the higher preference for less liquid assets, the higher

satisfaction from saving. As in the previous cases, the model diagnostics is satisfactory with pseudo R^2 equal to 0.418 and the correct prediction ratio at 86.8%.

6. Conclusions

The attitudes of students towards finance and investment are diversified. The study of the subject literature revealed that in most cases, the surveyed students' financial knowledge was at a level that was non-satisfactory for the challenges and possibilities offered by a variety of financial instruments. The research aimed to explore the attitudes of Polish students towards savings and investment considering many financial products. Furthermore, the research was concentrated on finding determinants that support students' propensity to save and invest and hitherto satisfaction from gathered funds.

The survey results dedicated to Polish students in 2018 support the hypothesis that they prefer saving to investing due to a low level of disposable income, which cannot be distinguished from a permanent one. Although 95% of students surveyed declared the necessity of saving money, over 80% store their money in bank accounts and as ready cash. Only 2.7% select instruments that allow investing money, such as, for instance, shares, bonds, cryptocurrencies, or real estate. The average level of their savings represented by the median in 2018 was around 1,500 PLN, which was approximately equal to 355 Euro. The low-income level, part-time job, and high costs of living are among the savings and investment barriers. Despite these, young adults are conscious that they should save, and they are often disappointed that they quickly spend their savings on consumption. Gender is related to the satisfaction from savings and preferred form of savings.

Three logit models were estimated based on the collected data set. They allowed revealing factors supporting the propensity to save and invest and subjective satisfaction from the financial results gained. The positive impact on the probability of saving is exhibited by the following variables: a decision to save money, satisfaction from hitherto savings, and considering saving into investment funds. The negative impact on the probability of saving comes from the preference to buy shares and the place of living. The propensity to invest is determined by a set of financial instruments that are available on the market. Satisfaction from savings is decreasing due to the preference of a bank account, gender, and age. Positive factors are related to the preference for more advanced financial instruments such as shares, bonds, investment funds, pension funds, and gold (metals). However, due to the explorative character of this study, further investigations are required.

References:

- Average Salary in Poland 2018. Report at: <https://www.polandunraveled.com/average-salary-in-poland/>.
Bai, H., Whitley, J. 1996. Forward looking consumption and financial liberalisation in the

- United Kingdom. In C. Allen and S. Hall (Eds) *Macroeconomic modelling in a changing world*. Willey and Sons.
- Bayar, A., McMorrow, K. 1999. Determinants of private consumption. *European Economy – Economic Papers*, 135, Commission of the E.C., DG ECFIN.
- Bencsik, A., Horváth-Csikós, G., Juhász, T. 2016. Y and Z generations at workplaces. *Journal of Competitiveness*, 8(3). doi:10.7441/joc.2016.03.06.
- Błach, J. 2011. Financial innovations and their role in the modern financial system-identification and systematization of the problem. *e-Finanse: Financial Internet Quarterly*, 7(3).
- Bolboacă, S.D., Jäntschi, L., Sestraş, A.F., Sestraş, R.E., Pamfil, D.C. 2011. Pearson-Fisher chi-square statistic revisited, *Information 2*. doi:10.3390/info2030528.
- Brennan, M.J., Xia, Y. 2002. Dynamic asset allocation under inflation. *Journal of finance*, 57(3). doi:10.1111/1540-6261.00459.
- Cameron, A.C., Trivedi, P.K. 2008. *Microeconometrics: methods and applications*. Cambridge University Press.
- Deaton, A. 2005. Franco Modigliani and the life cycle theory of consumption. *Banca Nazionale del Lavoro Quarterly Review*, 58, 233-234. doi:10.2139/ssrn.686475.
- Dębski, W., Świdorski, B. 2016. An allocation analysis of Polish household savings invested in financial assets, 2003-2014. *Contemporary economics*, 10(2). doi: 10.5709/ce.1897-9254.204.
- Dolphin, T. 2012. *Young people and savings, a route to improved financial resilience*. IPPR, London.
- Fong, J., Lope, N., Lucchi, M., McDermott, P., Trench, B. 2019. *An insider's guide to generation Z and higher education*. University Professional and Continuing Education Association.
- Fricker, R.D. 2008. Sampling methods for web and e-mail surveys. In N. Fielding, R.M. Lee, G. Blank (Eds). *The Sage handbook of online research methods*. Sage Publications Ltd. doi:10.4135/9780857020055.n11.
- Gostin, G. 2020. *Forbes Media*, Retrieved from: <https://www.forbes.com/sites/forbesbooksauthors/2019/05/01/millennial-spending-habits-and-why-they-buy>.
- Frączek, B. 2012. Analysis of factors affecting households saving and investment. *Studia ekonomiczne, Uniwersytet Ekonomiczny w Katowicach*, 122.
- Friedman, M. 1957. *A theory of the consumption function*. Princeton University Press.
- Generation Z on track toward retirement success – executive summary. 2017. LLC Each Enterprise.
- Hietanen, T. 2017. *University students' attitudes towards investing: A comparison between the United Kingdom and Finland*. Bachelor of Business Administration Thesis, Helsinki.
- Keynes, J.M. 1936. *The general theory of employment, interest, and money*. New York, Harcourt, Brace.
- Kirsanova, T., Sefton, J. 2007. A comparison of national saving rates in the U.K., U.S., and Italy. *European economic review*, 51(8). doi:10.1016/j.eurocorev.2007.01.005.
- Li, G., Doss, H. 1993. Generalized Pearson-Fisher chi-square goodness-of-fit tests, with applications to models with life history data. *The Annals of Statistics*, 21. doi:10.1214/aos/1176349151.
- McFadden, D. 1974. The measurement of urban travel demand. *Journal of Public Economics*, 3(4). doi:10.1016/0047-2727(74)90003-6.
- McLeod, S.A. 2019. *Likert scale*. Simply psychology. Retrieved from:

- <https://www.simplypsychology.org/likert-scale.html>.
- Millennials and Retirement 2020 – understanding, saving, and planning. Insured Retirement Institute, Washington D.C.
- Modigliani, F. 1966. The life cycle hypothesis of saving, the demand for wealth and the supply of capital. *Social Research*, 33(2).
- Musiał, M., Świecka, B. 2018. Enhancing Financial Literacy – Experiment Results. *Argumenta Oeconomica Cracoviensia*, 18. doi:10.15678/AOC.2018.1808.
- Pettigrew, N., Taylor, J., Simpson, C., Lancaster, J., Madden, R. 2007. Live now, save later? Young people, saving and pensions. The Department for Work and Pensions under license from the Controller of Her Majesty's Stationery Office by Corporate Document Services, Leeds.
- Pham, H. (ed). 2007. *Handbook of Engineering Statistics*. Springer. doi.org/10.1007/978-1-84628-288-1.
- Salesforce. Retrieved from: <https://www.salesforce.com/blog/2017/10/how-millennials-and-gen-z-are-different.html>.
- Shefrin, H., Thaler, R.H. 1988. The behavioral life-cycle hypothesis. *Economic inquiry*, 26(4). doi: 10.1111/j.1465-7295.1988.tb01520.x.
- Social and Economic Conditions of Student Life in Europe. Eurostudent VI 2016-2018. Synopsis of Indicators. Polish edition, March 2018. Retrieved from www.eurostudent.eu.
- Swadźba, U. 2017. To save or to spend? Students attitude towards money. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 501. doi:10.15611/pn.2017.501.11.
- Traynor, P. 2015. The generation game – savings for the millennial. *Performance*, 16.
- Walczak, D., Pieńkowska-Kamieniecka, S. 2018. Gender differences in financial behaviours. *Engineering economics*, 29(1). doi:10.5755/j01.ee.29.1.16400.
- Wiśniewski, J. 2016. *Microeconometrics in business management*. Chichester, John Wiley, and Sons. doi:10.1002/9781119154136.
- Zemke, R., Raines, C., Filipczak, B. 2000. *Generations at work: managing the clash of veterans, boomers, xers, and nexters in your workplace*. New York, American Management Association.
- Żmudzińska, I. 2016. Polish attitudes to regular and long-term saving. In Rurecka-Góra J. (ed.) *Long-term saving – attitudes, strategies, and challenges* (in Polish). Oficyna Wydawnicza SGH, Warszawa.

Annex:

Variables used in the study:

Symbol	Description	Type of variable
Y1	propensity to save	binary
Y2	propensity to invest	binary
Y3	subjective satisfaction with the results of savings	binary
Z1	decision of saving money	binary
Z2	value of personal savings (in PLN)	quantitative
Z3	frequency of savings (0 - no savings, 1 - irregular, 2 - regular)	ordinal
Z4	preferred forms of collecting savings	ordinal
Z5	preferring cash	ordinal
Z6	preferring bank account	ordinal
Z7	preferring shares	ordinal
Z8	preferring bonds	ordinal
Z9	preferring real estate	ordinal
Z10	preferring investment funds	ordinal

Z11	preferring life insurance	ordinal
Z12	preferring pension funds	ordinal
Z13	preferring cryptocurrencies	ordinal
Z14	preferring Revolut cash back system	ordinal
Z15	preferring gold (metals)	ordinal
Z16	experience with investment funds	binary
Z17	acceptance of investment funds	binary
Z18	investing for retirement	binary
Z19	gender	binary
Z20	age (in years)	quantitative
Z21	place of residence (village; city<25K; 25K>city>100K; >100K>city>250K; 250K>city>500K; city > 500K).	ordered
Z22	degree course (1 – for business, economics, finance and related, 0- otherwise)	binary