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Exploring Generation Z's Investment Patterns and Attitudes towards Greenness

Inga Pašiušienė [1], Askoldas Podviezko [2,3,*], Daiva Malakaitė [1], Laura Žarskienė [1], Aušra Liučvaitienė [1] and Rita Martišienė [1]

[1] Faculty of Economics, Vilniaus Kolegija/Higher Education Institution, Saltoniškių 58, LT-08105 Vilnius, Lithuania; d.malakaite@ekf.viko.lt (D.M.); r.martisiene@ekf.viko.lt (R.M.)
[2] Academic Department of Social Sciences, European Humanities University, Savičiaus 17, LT-01127 Vilnius, Lithuania
[3] Faculty of Public Governance and Business, Institute of Business and Economics, Mykolas Romeris University, Ateities 20, LT-08303 Vilnius, Lithuania
* Correspondence: askoldas.podviezko@ehu.lt

Abstract: Financial technology is quickly developing, making the financial industry more accessible and encouraging individual investor engagement in the investing process. Generation Z, characterised by a high level of digital literacy, curiosity, and receptivity to innovation, tends to very quickly make decisions and rapidly consume. Since 2007, there has been an increase in the number of articles analysing investor behaviour, drawing on insights from financial and psychological theories. The purpose of this exploratory study is to categorise the behaviour of students surveyed by the type of their investments, while at the same time assessing their willingness to choose green investments. The survey used in the analysis not only aims at collecting data but also educates students on the importance of critical self-awareness and the identification of their emotions to make rational, responsible investment decisions and, at the same time, to form a responsible investor who understands that investing is not only a way to earn a return but also can make a positive impact on the world when green investments are chosen. This study shows that studying students tend to be very rational and interested in contributing to greening the world; however, they are still hesitant to put their theoretical skills into practise and are more likely to provide theoretical support for green investments rather than actually invest. Respondents are grouped according to their potential investment behaviour. The proportions of groups are assessed using statistical inference with a precision of 95% that allowed to propose the method of deriving confidence intervals for each group estimation and, thus, making estimates both reliable and available as statistical estimations.

Keywords: investor behaviour; investor types; Generation Z; green investing

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1. Introduction

Financial technology (fintech) is transforming the financial service industry at an unparalleled pace. The rapid development of financial technology and the accessibility of financial markets to non-professional investors have led to a large number of young people trading in shares. According to a study by BofA Global Research, Generation Z investors are seeking to take advantage of market opportunities and make quick short-term profits. The authors showed that they frequently trade, take more risks, closely monitor their portfolios, and develop other conventionally "bad" investment habits. Such habits are criticised by investment experts [1].

In recent decades, the field of financial theories, behavioural finance, has been widely studied by incorporating various psychological insights to find out howemotions, experiences, other people's behaviour, trust, and other psychological causes influence the behaviour of investors [2–4]. A research group investigated the effect of investment sentiments and risk on financial behaviour in financial markets, generally supported by

mathematical methods [5–8]. A large and growing flow of research is related to young adults and their financial behaviour patterns, in which two indications are seen: the importance of strengthening the level of financial knowledge of Gen Z and the peculiarities of their investment behaviour [9–15]. More recent research complements studies on financial behaviour by including green investment issues, highlighting internal and external factors that impact such phenomena [16]. One of the reasons influencing the choice of green investment products is the fear of climate change and environmental catastrophe, as well as particular values [17,18]. The whole positive surroundings, in a particular state, are also important, especially some legal aspects [19]. For the green investing performance of Gen Z, who highly values communication, the impact of social platforms is significant [20].

Generation Z is characterised by great consumerism, infantilism, and narcissism; is perfectly suited for digital transformation; and values sustainability in the most diverse dimensions [21]. In the investment process, Gen Z demonstrates a high level of self-confidence [13], but, when there is more information, its decisions become more responsible and sustainable [14]). Generation Z's investment behaviour in financial markets attracts many researchers and leaves a gap for future studies.

The aim of this paper is to identify the types of Generation Z investors according to their tendency towards rationality and to find out how these groups react to green investments. This article uses a systematic literature analysis, a questionnaire survey, and graphical data representation methods. The authors conducted a survey of Generation Z at the Vilnius Higher Education Institution to investigate the rationality of the behaviour of young non-professional investors in financial markets and to improve the education of students about financial literacy.

The rest of the paper is organised as follows. Section 2 presents the literature review, and Section 3 presents the methodological part and shows the structure of the survey. Section 4 describes the empirical results. Sections 5 and 6 provide a discussion and the conclusions.

2. Review of the Literature

2.1. Financial Behaviour Concept, Characteristics, and Directions

The main objective of any investor is to minimise risk and maximise return. This is in contrast to speculators in financial markets, who are willing to invest in risky assets in the short term, hoping to profit from the spread between asset prices. Investors are divided into professional and non-professional investors. Non-professional investors are investors who have less investment knowledge and experience. This category includes the majority of natural persons who invest. This paper does not analyse the difference between the concepts of speculation and investment. Buying and selling shares is treated as an investment, regardless of its time horizon. In addition, in this paper, the word investor is used as a synonym for an individual investor, and this concept is equated with the definition of a non-professional investor.

Behaviour is a key concept taken from scientific human analysis and added to financial theory. The first ideas on the intersection of economics and psychology can be found in A. Smith's *The Theory of Moral Sentiments* (1759), but classical financial theory does not rely on these insights and argues that many rational investors operate in an efficient market [22]. The classical theory states that an investor is rational, makes rational decisions, has access to complete information, does not rely on emotions and preconceptions to make decisions, is deliberately risk-averse, and operates in financial markets for their own benefit. The rational investor is adept at using statistical and analytical methods to assess the financial benefits of investments. In the 1970s, the science of economics was full of scientific discoveries from cognitive psychology, showing that real people are not completely selfish and do not necessarily behave rationally. According to theorists, people often rely on preconceptions and emotions, the nature of the information they receive, and their own experience, as well as the experiences of others. Theorists claim that the investment decision-making process is influenced by a number of subjective and objective

reasons. Statman and Caldwell defined behavioural finance as a descriptive theory of choice under conditions of uncertainty [23]. Behavioural finance is concerned with the mind of investors and its role in making financial decisions. Influential researchers who have contributed to the development of the field include Kahneman and Tversky, Thaler, Baker and Wurgler, J. Shiller, and others. Hence, behavioural finance is an interdisciplinary branch that incorporates knowledge of economics, finance, psychology, and sociology and emphasises that irrationality and feelings impact investors' decisions and the asset price. According to performed bibliographic analysis, the number of research articles analysing financial behaviour has been rising, demonstrating that behavioural finance represents an important area of research [24,25].

Research on financial behaviour can be found in scientific journals on both finance and psychology. The field of psychology looks even more closely at deviance and the relationships between personality types. According to personality psychology, personality plays an essential role in the decision of investor behaviour and influences investor decision making [4]. Kumar et al. examined the relationships among traits such as herding behaviour, overconfidence, loss aversion, and five personality types and presented a possible decision tree [2]. Giancola et al. used the General Ecological Behaviour Scale to test the attitudes of 146 healthy Italian late adolescents and their relations with the Big Five theory, in order to adopt more environmentally suitable behaviours [26]. Singh et al. performed a cross-sectional research design to collect responses from 847 individual investors using a questionnaire. The study findings suggested that conscientiousness and extroversion traits significantly influence behaviour biases. The findings also explained that neuroticism is associated with herding, disposition, and anchoring bias. The findings confirmed the moderating effect of risk tolerance on the association between personality traits and behaviour biases [27]. The analysis of financial behaviour and self-confidence was conducted in the family economics stream, emphasizing the importance of family wellness for appropriate financial behaviour [11,28].

According to Paule-Vianez et al.'s bibliometric research, some biases of behaviour finance can be divided into some directions. The largest group is related to investor sentiment, which covers the aspect of how an investor's feelings lead them to make certain investment decisions, which are far from the optimal decisions according to the theory of efficient markets. The disposition effect, related to the analysis of investor risk aversion and expected stock returns, concentrating on the analysis of the movements of asset prices based on investors' behaviour, is also very popular among researchers. Other smaller areas include topics related to studies about overconfidence, the effectiveness of certain stock market strategies, portfolio selection, etc. [25]. The bibliometric analysis and literature review of investor behaviour in cryptocurrency markets have defined several clusters: investor sentiment herding behaviour, momentum and investor attention, news effects, and crypto markets' efficiency studies [24]. Research by the authors reveals that stock returns are influenced by investor sentiment [5]. Investor sentiment behaviour highlights the moods of investors, particularly for a short period of time. The authors measure it by using different ratios. The empirical results of this paper show that overnight returns on the TWSE cause short-term persistence and long-term return reversal, both of which are driven by investor sentiment and, therefore, verify the validity of overnight returns as an investor sentiment proxy [6]. Based on the research by He et al., geopolitical risks have significant negative effects on investor sentiment, suggesting that higher (lower) geopolitical risks directly or indirectly dampen (promote) investor sentiment [29]. Researchers have attempted to measure investor sentiment using various methods, mostly including surveys [7,8].

Numerous studies have examined Generation Z to understand their financial behaviour. Song et al. investigated financial behaviour by studying the impact of financial literacy, financial risk tolerance, and emotional intelligence using answers from 389 financially independent individual investors from leading educational institutes in Pakistan. The study found a significant modulating role of emotional intelligence in the direct relationship between financial literacy and financial risk tolerance and an indirect relationship

between financial literacy and financial behaviour [10]. The relationship between financial behaviour and financial literacy is a popular topic, especially in developing countries, where the authors find a huge gap between people who have received financial education and those who have not [10–12]. In this study, financial behaviours are categorised in the context of short- and long-term behaviours. Financial satisfaction, assessed financial capabilities, and knowledge are directly correlated with financial well-being. Financial stress has a long-term negative impact on financial satisfaction [30].

Financial behaviour can be associated with some determinants, for example, financial knowledge, some psychological traits, and subjective perceptions. With the rise of environmental concerns and the need to educate investors by adding a green attitude, the perspective needs to be regularly updated and tested with different sample groups. There is still a gap in such studies related to the types of personality of Generation Z and their attitudes to assess environmental information before making an investment decision. What are the general psychological characteristics of the chosen sample of Generation Z based on their investment habits?

2.2. Green Investing—Concept, Investor Behaviour Sentiment, and Influencing Factors

Green investing (more generally, sustainable investing) is another research area that stands out because green investing is a priority part of the European Commission's Green Deal Investment Plan [31]. Researchers are looking for answers to the question of what could further encourage investors to choose responsible companies and, thus, contribute to transforming the economy. Anderson and Robinson carried out a survey consisting of four blocks of questions: financial and environmental literacy; green behaviour; investment awareness; understanding of climate disasters. The results showed that the choice of green investments is also driven by fears of potential catastrophes caused by the effects of climate change, leading to a change in investment portfolios, which is an incentive for green investment. More generally, the study showed that climate fears are much more strongly linked to everyday consumer behaviour and are much less transferable to financial actions. The authors noted that monetary motives are also an important part of investment choices, with some respondents believing that environmentally friendly investments are profitable. This indicated that monetary motivations are part of the decision to invest in green funds or are a way to rationalise these beliefs [17]. Wang et al. combined investor behaviour sentiment and green concepts [18,32]. The study investigated the relationships among environmental news, investor sentiment, and green industry stock returns in China. Regarding the effect of investor sentiment on stock returns, to determine the impact of online environmental news on the stock returns of green industry companies in China, this study developed an environmental awareness index for the media. The empirical results showed that environmental news had a significant effect on the stock returns of green companies in China, and investor sentiment played a partially mediating role in the effect [18]. This study provided another insight into the green financial market by highlighting the importance of environmentally friendly financial instruments [32]. Dhasmana et al. emphasised that investor sentiment does not play a role in the impact of the ESG index. This implies that ESG initiatives may not immediately attract positive sentiments but have a positive impact on investors in the long term. The authors compiled an investor sentiment index that includes the following variables: advances and decline ratio, buy and sell imbalance, trading volume, turnover volatility rate, initial public offers, equity issues in a total of equity and debt, market-to-book ratio of dividend payers and non-payer firms, put call ratio, fund flow, security lending, and borrowing [33]. Trust has become the key component to ensure sustainable capital among green initiative companies. Promoting trust among investors, personal attitude, subjective norm, and perceived behavioural control found positive influence on trust in green financial products [34]. Other authors argued that the success of green investments as a new hybrid practice is impacted by the state's approach and its legal situation. Shareholder protection policies complement green investment and the promotion

of environmental goals, presumably because, in these countries, the legitimacy of investors is higher, thus amplifying the normative or cultural influence of green investment [19]. According to Agrawal, with respect to Gen Z, the influence of social networks has a positive impact on green performance [20].

The reviewed studies showed that there are many questions when analysing the causes for green investment. The combination of personal types of attitudes towards green investing is very important and novel. After the analytical studies, the question arises—what is the attitude of Gen Z towards green investing?

2.3. Generation Z—Investment Profile

The word "generation" is a certain phenomenon widely used in society that allows us to understand the differences between different age groups. The distinction between generations based on the time of birth is not very precise, as most countries have a unique history and have been directly affected by different demographic, historical, and socio-cultural phenomena. However, most scholars take a simple approach and divide generations according to the date of birth of people, taking into account the main events of a given period. The pioneers of the generation theory, W. Strauss and N. Howe (1991), define the following generations: the Baby Boom Generation (1943–1960), Generation X (1961–1981), Generation Y/Millennial Generation (1982–2004), and Generation Z/Internet Generation (since 2005) [35]. Researchers point to different characteristics of Generation Z: hyperactivity, infantilism, consumerism, lack of concentration or attention, communication, and critical thinking. This generation does not like to be tied to static work in offices; it is characterised by a dynamic working style and multitasking [36]. According to E. Kocai, these young people today are characterised by disorientation, apathy, and conflict between acceptable values and those imposed on them by others, while consumption is becoming one of the most important foundations of their individual lifestyle [37]. Dolot argued that a characteristic feature of the Generation Z sample is that, despite their young age, they are already professionally active [38]. Hernandez de Menendez et al. found that Generation Z prefers to learn through new technologies, such as virtual and augmented reality, 3D printing, artificial intelligence, holograms, wearable technology, virtual laboratories, and the blockchain [39]. The behaviour of Generation Z investors in financial markets is of interest to many researchers. Chen et al. argued that, although Generation Z has qualities such as creativity, receptiveness to information, and the ability to multitask, it is impatient and want quick solutions: it is result-orientated rather than process-orientated and does not like long, monotonous activities [3].

In the literature, this generation is considered to be more environmentally conscious and is green and willing to pay more for eco-friendly products [40,41]. The study showed that Gen Z is a generation that wants to feel personally connected to sustainability ideas [42]. It was found that environmental concerns positively influence the willingness to pay more for green products by consumers of Generation Z. Generation Z also expects retailers and brands to become more sustainable [20]. Digital natives, with a sense of equality, social justice, and environmental awareness, people from Generation Z value money more than previous generations and, as such, are conscientious in their consumption choices. The results showed that environmental concerns, the estimation of the future being green, and the perceived quality of green are potential determinants of the consumption of green products by Generation Z and positively influence the willingness to pay more for green products [21]. Social media and its effect on the green practices of Gen Z guides businesses and marketers in promoting their green initiatives [20,42].

In their research, Rosdiana identified a very high level of self-confidence as a key characteristic of the investment decisions of Generation Z. This suggests that only a high level of investment capacity can lead to efficient, well-considered, and unhurried investment decisions [13]. Philippas and Avdoulas conducted a survey of Greek students (2019–2020), and the analysis revealed that the more information young people have, the more responsible their decisions are, which is why it is important to understand their attitudes towards

investing and develop them. The authors found that male students are more financially literate than female students. Their findings show that students who are more financially literate are better able to withstand unexpected financial shocks [14]. Artavanis and Kara examined the level of financial literacy of US students (University of Massachusetts) and its impact on the repayment of student debts. They observed low levels of financial literacy (39.5%), especially among female students (26%) and first-generation students (33%) [15]. Furthermore, students with financial literacy deficiencies are more likely to underestimate future student loan repayments, and up to 38.2% of low-literacy students underestimate future risks. The authors noted that students with lower financial literacy expect to earn lower salaries in the future. Gedvilaite et al. combined two concepts, financial literacy and sustainability knowledge, in order to test the attitudes of Generation Z in the three Baltic countries (2021) and found that the sustainability knowledge level is equal in these countries [9]. The majority of Polish respondents from Generation Z also stated that the implementation of the CSR concept in an organisation is an important factor in deciding whether to invest capital [16].

The key characteristics of Gen Z are that it values money, is impatient, and relyies on technologies, but it also values sustainability ideas. What are the attitudes of Gen Z towards green investment and how are these related to psychological patterns?

The current research contributes to the financial behaviour theory by examining how personality factors affect behaviour biases. The existing literature on behaviour finance stated that the investment decision-making process is based on a complicated mix of personal characteristics (personality traits, risk tolerance, emotions, etc.) ([43,44]) and demographics (i.e., gender, age, education level, etc.) [45]. This research focuses on studies that combine financial behaviour theories, the green approach, and Generation Z's particularities. This article emphasises the problematic question of what types of investors Generation Z tends to be. The results might improve the process of learning about and consulting on investing, taking into account the characteristics of Generation Z and personality types. The significance of the green economy in financial markets inspires the inclusion of additional questions to investigate Generation Z's attitudes towards green investing and, at the same time, to stimulate more interest in it.

3. Methodology

In order to investigate the behaviour of Generation Z investors in financial markets, the Pompian MBTI model was chosen [46].

There are many articles in psychological journals [2,4,26] that combine the special set of personal characteristics and particular financial behaviour. Such studies lead to better understanding of various internal determinants and help in self-assessment and decision-making understanding, as well as in improving consulting and teaching processes. The Pompian model was chosen as the very clearly systemised methodological approach suitable for the first exploratory research. Furthermore, the method is very useful for promoting smart educational processes by incorporating self-assessment.

Pompian argues that some investors have little time and patience to manage their finances, others start investing too late, and some show more discipline in investing in the financial markets than others. The model of M. M. Pompian identifies eight possible types of investor personalities based on the three dimensions of the investor personality profile. The Pompian MBTI model and the questionnaire survey research method were applied to investigate the behaviour of Generation Z students studying at the Vilnius Higher Education Institution who invest in the financial markets.

The survey questionnaire consisted of 15 diagnostic questions divided into three blocks of five questions each, according to the personality dimensions of investors. The questionnaire was designed using closed-ended questions. The first block of questions was designed to determine whether the investor is an idealist or a pragmatist (I or P) according to their personality profile. The second block of questions identified whether the investor is a framer or an integrator (F or N), and the third block of questions asked whether the

investor is a reflector or a realist (T or R). The letters in the Pompian model represent the good and bad characteristics of investors. The bad characteristics, i.e., irrational behaviour in financial markets, are typical of the idealist (letter I from the first dimension), whose main distinguishing features are overconfidence and a reluctance to seek out more information; the framer (letter F from the second dimension) is characterised by attachment to certain information and reluctance to analyse external factors. The reflector (letter T from the third dimension) is characterised by fear and reluctance to take proactive action. Conversely, the pragmatist (letter P from the first dimension) has good qualities, i.e., rational behaviour in financial markets, demonstrates a good understanding of reality and of oneself, and tends to extensively analyse. The integrator (letter N from the second dimension) is characterised by a systematic approach and the ability to structure their portfolio. The realist (letter R from the third dimension), unlike the reflector, has the courage to make decisions. Following the questionnaire survey and the analysis of the responses of the respondents, in order to identify the predominant trait in each of the three dimensions, eight three-letter acronyms (IFT, IFR, INT, PFT, INR, PFR, PNT, and PNR) were created, indicating the combination of traits that to the classification of the investor in one of the eight investor personality types. This model was supplemented with questions on green investment propensity to determine which types of students were more likely to consider the environmental impact of their financial decisions.

The study population consisted of all students of the Faculty of Electronics and Informatics, Faculty of Economics, and Faculty of Business Management of Vilnius Higher Education Institution, born in 2000 and later, i.e., 2446 students in total. The survey questionnaire was sent to students at Vilnius Higher Education Institution by e-mail. The MS Office 365 Forms package was used for the survey, and the obtained data were processed in MS Excel. The survey was carried out between February and March 2023.

The initial decision for error with a statistical precision of 95% was to keep it close to 5%, resulting in a sample size estimate of 273 cases, where the maximum variance of the binomial distribution was reached with probability. After this prior estimation and collecting and, finally, discarding invalid responses, we obtained a satisfactory number, n = 379, of valid responses for cases of a smaller proportion of the responses than 50%, as the smaller proportion further decreases required n for the error chosen. Frequencies of the types were gleaned in numbers and converted to percentages. Due to the stochastic character of answers, for making extended generalisations about population of students with similar characteristics, we decided to solve a problem of estimating the error for the obtained proportion of responses. Responses were structured in a way that belonging to each dimension of the students were read in the Boolean format; therefore, the binomial distribution could be applied for description of the whole population of similar students in terms of a percentage of a particular dimension within the population, with probability of success equal to the percentage rate of positive responses. The dispersion is known to be equal to the product of the probability of success and failure. Inference relates to stochasticity, and, therefore, it needs additional exploration in terms of reliability of qualitative interpretation. We used the above-described parameters for estimation the error margin, e%, for each dimension with a precision of 95% and for the number of valid elicited responses. The formula for such estimation was derived by substitution boundaries of 95% probability interval of the standardised normal distribution (which is asymptotic to the binomial one), to the following formula of required number of respondents [47,48]:

$$n = \left(\frac{Z_\alpha}{e}\right)^2 S, \quad (1)$$

where α is the confidence level; Z_α is the boundary of the standardised normal distribution that cuts the zone of probabilities around zero of the chosen reliability of the statistical model; S is the estimation of dispersion from the sample; and e is the acceptable error expressed in percentage that expresses the boundary of the confidence interval.

Confidence intervals are, therefore, derived using the previously described parameters in accordance from the modified Formula (1).

$$e = Z_\alpha \sqrt{\frac{S}{n}}, \quad (2)$$

Such errors of inference represent boundaries of confidence intervals; they are shown in Figure 1. Analysis of the results can be carried out based on exact percentage numbers elicited from responses because statistical confidence appears to be rather moderate: up to 4.23%.

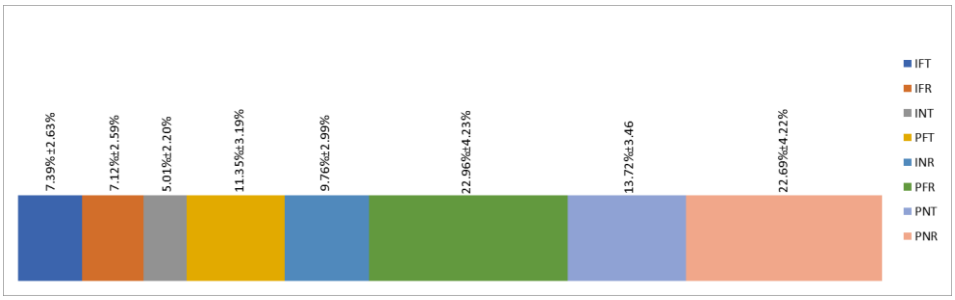


Figure 1. Proportions of dimensions of the investor personality profiles among students and errors of inference.

Proportions shown in Figure 1 reveal the structure of investors by personality dimensions and lead to the following results and conclusions. Assessment of the general preference of all respondents towards green investment is made by testing the following statistical hypothesis:

H0. *Students are not inclined to be in favour of green investment*.

H1. *Students are inclined to be in favour of green investment*.

The limitations of this study are that the results were obtained from one country and one educational institution. The data cover the respondents referring to Generation Z from two faculties—economics and electronics. Students in both faculties have enough knowledge to manage investments. To secure anonymity, the decision not to collect data based on gender was confirmed.

4. Results

A comparative theoretical analysis between Generation Z's theoretical traits and those presented by M. M. Pompian shows that researchers attribute more traits from the negative traits scale (idealist, framer, and reflector) to Generation Z and that this is in line with other studies [3,13,37]. Overoptimism and self-confidence make them similar to idealists, and they are not inclined to think much about external actions, relying on what the situation looks like at the time, like framers, and trying to rationalise decisions that are not always correct, like reflectors. The questionnaire survey aims to observe the predominant characteristics among current students as current and potential investors.

It is important to note that not all of the respondents claimed to have no experience in investing and answered the questionnaire by imagining they were investors. A lack of funds is one of the reasons why students studying these subjects do not actively try real opportunities, but a lack of self-confidence may also play a role.

The visualisation of the distribution of personality types of investors, as presented in Figure 1, could be used to perceive the proportions of the combined dimensions of more general personality types. Overall, 46.5% of the respondents belong to the group of "good" investor personality types (INR, PFR, and PNT types), which are more rational,

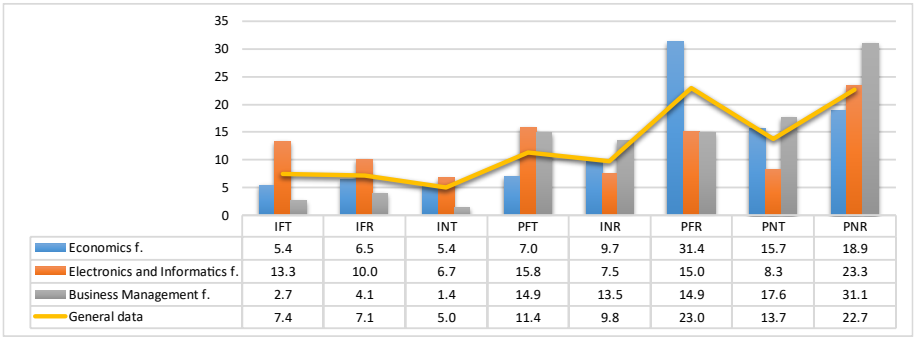
and 22.7% are "excellent" (PNR type), according to Pompian's model. And only 24% need improvement (IFT, IFR, INT, and PFT types). Almost a quarter of them belong to the pragmatist/framer/realist (PFR) investor personality type.

Similar to above, the errors of inference or boundaries of confidence intervals that estimate the magnitudes of each group with a precision of 95% are as follows: e = 5.02% for the group that comprises the INR, PFR, and PNT types; e = 5.02% for the group that comprises the INR, PFR, and PNT types; e = 4.30% for the estimation of the magnitude of the group of the IFT, IFR, INT, and PFT types, while inference error margins for the group PNR and the group PFR type are shown in Figure 1.

Among respondents with more rational behaviour, the personality type of pragmatist/framer/realist (PFR) for the investor is among the most dominant (see Figure 1). A further 23% of respondents have fully rational investment behaviour (PNR investor personality type). And 31% of respondents need to improve their behaviour in financial markets because their behaviour is irrational (IFT, IFR, INT, and PFT investor personality types combined). Even students who are studying such pragmatic programmes (social and technical sciences) have some irrationality in their behaviour in financial markets. The inference error margins for such groups are provided above.

Initial observations are provided based on responses within each group, although similar estimates of reasoning errors cannot be made due to the small number of group members; however, we intend to increase the group of respondents in future studies and provide better estimations.

The personality type PNR, described by Pompian as an excellent type with reasonable behaviour, is shared by 31.1% of students in the Business Management faculty (Figure 2). The highest scores are 18.9% from the Faculty of Economics and 23.3% from the faculties of electronics and informatics. Students from the business management faculty tend to have the most favourable opinions towards rational behaviour in the financial markets, which supports the logical conclusion that these kinds of studies may have a significant influence on more rational behaviour.



	IFT	IFR	INT	PFT	INR	PFR	PNT	PNR
Economics f.	5.4	6.5	5.4	7.0	9.7	31.4	15.7	18.9
Electronics and Informatics f.	13.3	10.0	6.7	15.8	7.5	15.0	8.3	23.3
Business Management f.	2.7	4.1	1.4	14.9	13.5	14.9	17.6	31.1
General data	7.4	7.1	5.0	11.4	9.8	23.0	13.7	22.7

Figure 2. Distribution of investor personality types by faculty.

Therefore, this exploratory study reveals that Generation Z respondents tend to be rational investors, similar to the results of a study conducted by Bikas and Kavaliauskas, which surveyed Lithuanian investors (in this study, the majority of respondents were from the older generation) [49]. However, it should be remembered that these are students of the Faculty of Economics, and, according to many researchers, more rational decisions are made by those who have more financial knowledge [3,13,14].

Generation Z is described by many scholars as a materialistic generation, with a strong consumerist streak, as was also presented in [21] but with an appreciation for sustainable ideas confirmed by other studies [16,40–42]. According the research's results (are shown in Figure 3), the majority (75%) of the respondents feel responsible for the impact on the Earth's climate and the negative effects of climate change on the planet and on people. Also, 72% of the respondents believe that a decision to invest in the shares of sustainable companies that have chosen to go green can have a positive impact on the future of the

planet. Almost half (48%) of the respondents would invest in green technology companies because they believe that the sector is promising and that the company's choice of a green course is in line with their approach to responsible investment. In addition, 53% of the respondents say that they would consider investing in green companies' shares after the survey, while 12% say they are already choosing green investments.

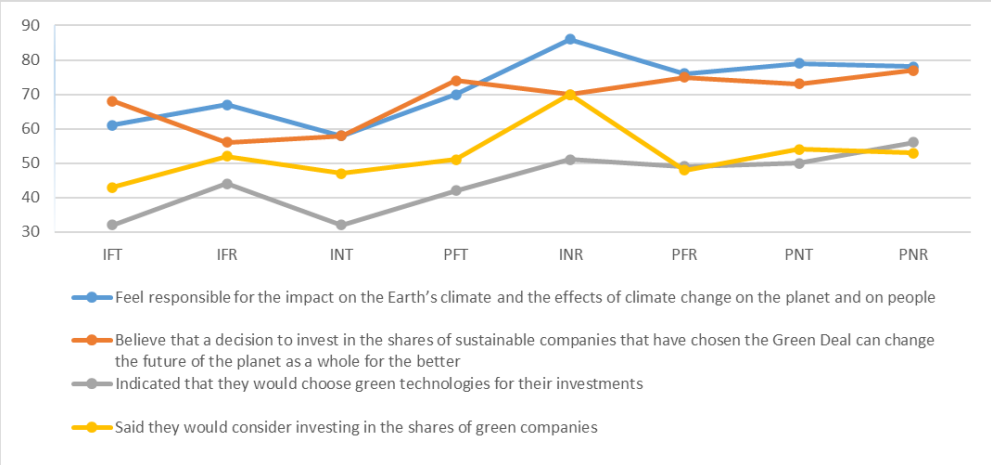


Figure 3. Green investment preferences by type of investor personality (%).

The analysis of the survey results provides possible links between the personality types of the identified investors and their propensity to green invest. The relation between investor types and green investment preferences can be observed in Figure 3.

Students with the idealist/integrator/realist (INR) investor personality type are the most likely to green invest. As many as 86% of this type of investor indicate that they feel responsible for the impact on the Earth's climate and the effects of climate change on the planet and people. Also, 70% of this type of investor believe that investing in sustainable green companies can change the future of the planet for the better, and they are investing now or plan to do so in the future. In addition, 51% of the respondents belonging to the INR investor type say that they would invest in green technology companies because the companies' choice of a green course is in line with their approach to responsible investment. However, 35% of this investor type still believe that investing is all about maximising returns and would, therefore, choose potentially more profitable stocks, regardless of the company's choice of exchange rate. The INR investor type is characterised by high self-confidence, broad-mindedness, and courageous decision making.

The survey shows that idealist/integrator/reflector (INT) investor personality-type students are the least likely to think about green investments: 58% of this investor personality type feel responsible for the impact on the Earth's climate and the effects of climate change on the planet and on people, while 32% indicate that they would choose green technologies for their investments; 47% of students of this type indicate that, for them, earning the highest possible return is the most important goal, regardless of the nature of the company's activities, so they would choose to invest in a company whose shares have a better chance of generating a higher return.

All responses to the four questions outlined in Figure 3 make a total of 740 answers, while the number of positive responses in the sample make 496 in total. This makes 67% of the responses positive. The standard deviation of the mean of such replies makes up 1.73%, calculated by using the formula for the standard deviation for the mean of a binomially distributed random variable expressed as a percentage. The difference between the mark of 50%, which would mean perfect indifference, and 67% is much greater in terms of such standard deviations than the right-hand side threshold of the standardised normal distribution for a 95% probability, which is 1.645. We, therefore, can reject hypothesis H0,

with the stated degree of statistical precision, and claim that the students of Generation Z have a propensity for green investment.

Despite the fact that most students feel responsible for the impact on the Earth's climate (blue line on the graph), they mostly think about it and consider it, instead of actually being ready to choose green investments at the moment (grey line). In this case, there is a scope for further study on green investments. Better psychological knowledge leads to a more realistic perception of oneself and the world. Analysing fears and influences and channelling them towards positive goals can facilitate decision making and increase financial well-being, as well as more effectively contribute to the green transformation. Hence, it is clearly seen that Generation Z sympathises with a sustainable world, and this notion was confirmed by many other studies [16,20,21,42]; the rational basis to choose faster profit is also very strong, as other authors noticed [36,37]. However, it should be remembered that the more Generation Z knows about environmental economics and improves their sustainability and financial literacy, the more they are responsible consumers and investors [9,14,19,21,34].

5. Discussion

The growing concern about the rapid environmental degradation impact increases the attention to the green concept at investment levels. The transformation of investment patterns, which has only been orientated to make profit in the early days, should include environmental risk. Generation Z, whose attitude analysis is very important for practitioners and politicians, will soon be leaders. First, the results of research provide a better understanding of the existing academic literature on young investor behaviour, consolidating its knowledge, and identifying gaps to facilitate future studies; second, this study provides valuable research findings for investors, academics, policymakers, businesses, professionals, and society. The assessment of Generation Z investment patterns often falls under the concepts of finance and psychology. Researchers' have conducted surveys of students, and their research shows that the more information young people have, the more responsible their decisions are, which is why it is important to understand their attitudes towards investing and to nurture them, which is in line with other studies [9,14,19,21,34].

We suggest that green attitudes should be encouraged, and such behaviour fosters ecological well-being. Generation Z is keen to be more sustainable [16,20,21,42], but, in many cases, short-term profit impacts its real decision [36,37]. Our results show that positive attitudes towards the green economy are often not linked to actual actions.

Limitations of the Study

Most students of economics know what the correct answer should be according to the theoretical approach being taught, and this may have introduced bias into the survey responses. In the future, the survey will be expanded to include more students from other fields, with a subsequent comparison of their responses. Another direction can be the analysis of comparing survey results and the real situation and what factors impact mismatching.

Assuming that the accuracy of the model estimating the size of investor personality profiles was achieved by using statistical inference for the elicited 379 valid responses, for the binomial distribution with the probability parameter equal to the percentage of individuals with a particular dimension, and by taking a reasonable level of statistical precision of 95%. The number of responses represented a large part of the above-described population of students and, therefrom, produced moderate inference errors. Consequently, it is probable that the derived proportions represent the corresponding population well in terms of the dimensions of the investor personality profile. The probabilities in the binomial distribution are quite strongly divergent from 0.5; consequently, the hypothesis about the propensity of the students towards green investment is formulated and accepted. The sizes of each dimension appear to be too small for estimating the precision of the responses within each group; consequently, this investigation will be extended in future studies.

The limitation is that the sample includes only one educational institution and only one country. Expanding the sample to different countries and having a broader comparative analysis can enrich the results and impact.

6. Conclusions

Classical financial theory states that investors operating in an efficient market are rational. Rational investors in financial markets seek to maximise their own financial gain by using their analytical skills. However, experts in cognitive psychology dispute this, arguing that individuals do not always behave rationally. Investors' decisions are often influenced by emotions, preconceptions, personal experience or the experiences of others, and other psychological reasons; therefore, researchers in this field classify investors into types according to the factors that determine their behaviour. Research on cognitive psychology confirms that some non-professional investors behave irrationally in financial markets, which reduces their wealth and negatively affects their financial performance. Irrational behaviour in financial markets is also a characteristic of Generation Z due to the characteristics attributed to them, such as a lack of patience, a desire for quick solutions, an intolerance of monotonous and consistent activity, and excessive self-confidence. Each generation is unique, with positive and negative traits. The positive thing is that the life of Generation Z is much more dynamic: they are quick at decision making, good at managing information, and active in investing thanks to their excellent use of investment apps. Materialism or consumerism can be mentioned as a negative characteristic of Generation Z. It is a materialistic generation that pays a lot of attention to brands, chasing fashion and innovation.

According to the Pompian scale and theoretical research on generations, it was observed that Generation Z has more problematic traits (idealist, framer, and reflector), which have to be improved during educational and consulting procedures. It was hypothesized that, according to the general characteristics, the representatives of Generation Z can be classified as a group of personalities that are less rational. However, this was not observed during the study of VIKO students. This study showed that most of the students in the study behave rationally in financial markets, while only a small proportion of them are more likely to rely on emotions and other psychological factors when investing. The results by type of investor showed that Generation Z has relatively good investment skills and intuition. Many students demonstrated pragmatist qualities, such as a good understanding of reality and themselves, and the ability to justify actions through analytical analysis. Only a small proportion (24%) of them fell into investment types whose overoptimism and self-confidence still need to be reduced. Their technical and social studies, which are based on a logical approach, may also have an impact on these results. The Faculty of Business Management was found to have the most favourable attitudes towards rational behaviour in financial markets.

An additional study aimed to identify students' attitudes towards green investing. Most of the study students felt responsible for the individual impact of each investor on Earth's climate and the effects of climate change on the planet and people and are, therefore, inclined to invest in green securities; however, there was a significant gap between their understanding and their actual willingness and commitment to do so. Overall, 86% of the INR cluster have felt responsibility for their investment decisions' impact on the global environmental state. Hence, as they are rational enough investors, 35% of them still believe that they should choose potentially more profitable stocks.

This article's findings expanded financial behaviour studies by combing psychological analysis and the attitudes towards greenness of Generation Z. It confirmed that, in addition to Generation Z's sympathy for sustainability, it is not very quick to choose green investments.

Our results showed that Generation Z could be more responsible in its actions, as its affinity for sustainability should be confirmed by its green investment choices. In contrast, policy makers should improve education curricula to make green and/or sus-

tainable subjects compulsory in all subjects taught. Expanding such a kind of research to other countries could add a broader comparison of the cultural aspects. It would also be of great interest for further research to involve researchers from psychological fields to explore the links between the various attributes and the actual actions that influence ecological transformation.

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