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Canova, Luciano and Paladino, Giovanna

Scuola Enrico Mattei (Eni Corporate University), IntesaSanpaolo

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# Gen Z, Personality Traits and Sustainability Awareness: An Econometric Investigation

Luciano Canova\* and Giovanna Paladino\*\*

## Abstract

Since 2018 the awareness of sustainability issues and climate change has increased significantly, especially among the younger generation. The COVID-19 pandemic and the related shutdown of many economic activities contributed to raising concerns about the conservation of biodiversity, the environment, and personal economic well-being.

In this study, we examine how members of Generation Z deal with issues related to environmental sustainability and personal money management.

By using the technique of the principal component analysis, two synthetic indexes were computed from a set of variables associated with the answers to a questionnaire that investigates the approach to environmental and economic sustainability by a representative sample of 400 Italian youngsters aged between 13 and 18 years. The GREEN INDEX is the result of the aggregation of environmental practices while the MONEY INDEX represents habits in personal money management. They are used as dependent variables of linear, ordered probit, and bivariate probit regressions to detect how socio-demographic factors and personality characteristics are associated with sustainability awareness.

Our results show the overall importance of character traits - such as curiosity and scrupulousness - in improving the level of awareness and the strong statistical association between attention to money management and a sense of responsibility toward the environment. This finding hints that working on one dimension may produce a positive spillover effect on the other, setting in motion a virtuous circle for policy implementation.

**JEL Classification:** G53, Q50, J10

**Keywords:** Sustainability, Environment, Financial Education, Gen Z

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\* Scuola Enrico Mattei (Eni Corporate University), [luciano.canova2@eni.com](mailto:luciano.canova2@eni.com)

\*\* IntesaSanpaolo, [giovanna.paladino@intesanpaolo.com](mailto:giovanna.paladino@intesanpaolo.com)

## Introduction

This study aims to answer the following question: "How does Generation Z face the issues of economic and environmental sustainability?"

Sustainability education is increasingly at the center of policymakers' agenda, as demonstrated by the Sustainable Development Goals (SDG) initiative - approved in 2015 by the United Nations (UN) and defined as a framework of 17 objectives in a roadmap toward achieving a more sustainable economy in 2030 - and by the centrality of Environmental, Social and Governance (ESG) issues in business strategies. The issue of sustainability has become the subject of investment programs, which have significant monetary impacts, as shown by the European Union's commitment to allocate 30% of the 1,800 billion allocated for the 2021–2027 budget for the transition toward a decarbonized economy.

The 360° vision of sustainability also includes specific attention to economic/financial education: humankind and the environment have no sustainable interaction without careful and rational management of economic resources both at personal and community levels. Unfortunately, less than 40% of individuals in Italy can be defined as financially literate, with significant inequalities in terms of gender, educational qualification, and at least partially, geographical distribution. Financial education is also very low among students of all grade levels. According to the latest OECD Pisa survey,<sup>[1]</sup> the percentage of Italian students that can solve the most complex tasks (top 5-level performer) is less than half of the OECD average (4.5% vs 10.5%), while about one out of five students lack the minimum skills necessary to make responsible and well-informed personal financial decisions.

An analysis by the Bank of Italy in 2020 (D'Alessio et al., 2020) confirmed the deficiency of financial skills of Italians.<sup>[2]</sup> The survey uses the OECD methodology, which derives an overall indicator of skills from the scores calculated for three subdimensions: knowledge, behavior, and attitudes. The study, through an econometric analysis, shows only a small improvement in the knowledge component, while behaviors and attitudes are slightly worse off than in previous surveys.

Our research intends to investigate a segment of the population that is not included in surveys aimed at understanding the sensitivity to environmental issues and the link the latter has with money management at the personal level. Our purpose is to identify any spillover between the two dimensions, which could be useful from the perspective of public policy design and implementation. Therefore, we focus on the attitude component and potential effectiveness of the educational interventions that exploit the overlap between the environmental and economic dimensions (the latter meant personal money management).

The question, though of great relevance, has not yet been the subject of careful analysis in the literature. Only a few contributions have investigated the attitudes and behaviors of Generation Z in terms of money management and sustainability. For example, Li and Leonas (2022) present the results of an analysis of the purchase of swimwear by a sample of 257 young women. The authors found that price is the key factor but is accompanied by elements such as the materials used in the production of the apparel and information concerning the sustainability of the production process. Another study (Bollani et al., 2019) based on data from 267 university students of the millennial generation focuses on the relationship with food, highlighting how the information and actions aimed at reducing food waste and waste generation are increasingly important for young people.

Other studies have delved into aspects more related to lifestyles and behaviors. An analysis of 362 young American consumers (McCoy et al., 2021) reveals how much the consumption pattern

inspired by the so-called sharing economy is gaining ground compared with that based on ownership of tangible assets or electronic devices. The study in question highlights how, among the reasons that explain the phenomenon, sustainability is perceived more and more as a "status". By using American data, Cho et al. (2018) study the trend of reduced participation in voluntary activities and focus on a sample of 360 Generation Z individuals to investigate the motives behind this trend, highlighting sustainability as a strong motivational lever.

Beyond surveys or questionnaires that contain specific sections dedicated to environmental sensitivity, such as the European Social Survey of 2018,<sup>13</sup> which has a thematic focus on global warming, not many studies have focused on the younger population so far and examined the relationship between environmental sustainability and attitudes in the use of personal money.

Some literature reviews have focused on the role of sustainability education starting from childhood. For example, Breßler et al. (2017) established a taxonomy of the characteristics and learning objectives of Education to Sustainable Development paths, more importantly identifying a framework that can guide research, including empirical studies, to examine their impacts.

In a meta-analysis, Somerville and Williams (2015) highlight how the number of publications dedicated to the topic of sustainability education has increased significantly over the last few years by identifying three lines along which the research has been developing: connection with nature, children's rights, and theoretical frameworks.

A review by Samuelsson and Park (2017) details the results of an analysis of the relationship between sustainability and childhood by focusing on objective 4 of the SDGs, which guarantees access to quality education services for all. The article addresses the importance of introducing the theme of sustainable education from the primary school and focused on the quality of school services as an intrinsic element of sustainability if viewed from the perspective of *lifelong education*.

An interesting study is that of Bamberg and Moser (2007), who conducted a meta-analysis of psychological articles, published over the last few decades. It reports the main results regarding the characteristics/behavioral components that correlate with environmental sensitivity. This is an article of interest for our research, as the following analysis delves into the dimension of character traits.

Another relevant factor is the role played by the family in kids' education. Our behavioral indexes catch personality traits in which the family has a part for personal examples and transmitted values. A recent retrospective analysis (Le Baron et al. 2020) - conducted on a sample of 437 adults from the Flourishing Families Project - finds that overt financial education from parents during childhood is associated with a greater frequency of healthy financial management behaviors in emerging adulthood.

On parental socialization, a paper by Olszewski -Kubilius (2018) points out that family has relevant effects on childhood development by impacting attitudes, beliefs, opportunities, habits, and personality traits. The paper discusses why different outcomes and patterns occur with a focus on the psychological aspects of family functioning as it affects the talent development of kids. With specific reference to environmental sensitivity, Thomas et al. (2018) indirectly enlighten the complex role of the family by investigating the impact of having children on the development of environmental awareness. Willingness to engage in sustainable actions may be limited by the psychological distance of climate change. In this study, the authors test the legacy hypothesis. Using the Understanding Society dataset, a longitudinal survey representative of the UK population (n = 18,176), the researchers assess how having children may change environmental attitudes and behavior. We

contribute to this literature by focusing on Gen Z and the possibility of growing a mature awareness of environmental and economic sustainability.

Another interesting study that investigates the relationship between environmental sensitivity and other specific skills is that of List et al. (2020), which use data from the OECD PISA survey and compare the linguistic, mathematical, and scientific skills of 15-year-old students at an international level. The research highlights the correlation between scientific skills and the development of awareness of sustainability importance.

Finally, the only study we found that considers environmental and economic sustainability for young adults between 23 and 26 years old, is that of White et al. (2018). Based on a series of self-reported intentions and answers to some questions about the knowledge of financial concepts, saving behaviors, and the perception of trust and self-control the authors find a positive association between attitudes to environmental sustainability and healthy money management practices.

Our article is structured as follows: section 2 describes the data and the main sociodemographic characteristics of the sample; section 3 illustrates the empirical methodology and the identification strategy of the econometric model; section 4 presents the results, and section 5 concludes.

## **Data description**

An online survey was conducted to collect sociodemographic data and information on a sample of 400 Italian adolescents aged between 13 and 18 years.<sup>[4]</sup> To our knowledge, it is the first attempt to investigate directly preferences and attitudes of this specific cohort and we believe the originality of the dataset contributes to a, still limited, literature in social sciences. The degree of coherence among the answers highlights the ability of the youngsters to provide sensible and reasonable feedback and gives reassurance on the degree of reliability of the survey.<sup>[5]</sup> The sample size is equivalent to that used in other published studies on Generation Z.

The questionnaire was distributed between February 5 and 17, 2021. The sample was selected to be representative of the population of young Italians at many levels: age, gender, and geographical residence.

The socio-demographic information provides some indications of family background and is summarized in Tables 1 and 2. From these, we can deduce that the sample shows a slight prevalence of males over females and - given the age range- a majority of high school students (80.6% of the sample), with a preponderance of technical institutes rather than high schools (71.4% vs 28.6%). The age groups are equally distributed. The geographical distribution indicates a greater number of adolescents interviewed in the South and the Islands than in other macro-areas, in line with a relatively greater presence of youths in these regions. From the point of view of the family cultural background, the presence of at least a parent with a BA degree (19%) is consistent with national data and decreases to 14% in the case of both parents with a BA degree. The most frequent qualification for both parents is a high school diploma. Approximately 31% of the children interviewed have between 25 and 100 books at home. This percentage gradually decreases to 10% for ranges between 201 and 500 and to 5% for more than 500 volumes.

Among boys and girls, a split in "preferences" is apparent between scientific subjects (55% of males versus 32% of females) and humanities (43% of females versus 20% of males). This is a likely indication of the cultural conditioning of social origin, which has its roots in the family and is not questioned even by schools.

In addition to demographic information, the survey consists of four sections. The first one aims at identifying the personality traits prevalent among youngsters and is inspired by the European Social Survey, Personal and Social Well-Being section.<sup>14</sup> It is composed of 17 questions that aim to measure: emotional stability, open-mindedness, conscientiousness, social confidence, happiness, and sociability. These characteristics may be related, directly or indirectly, to the well-known Five-Factor Model (Matthews and Whiteman (2003), among others). They are openness, conscientiousness, extroversion, agreeableness, and neuroticism. Despite this model being well-established in psychological literature, there are a few limitations. These are associated with its inability to address core constructs of personality functioning beyond the level of traits, limitations concerning the prediction of specific behavior and the adequate description of persons' lives, and with failure to provide compelling causal explanations for human behavior (McAdams 1992).

Thus, we prefer to test 17 personality features in our questionnaire and leave the task of regrouping them to the cluster analysis as described below.

Table 3<sup>15</sup> presents the grouping of personality traits obtained through a cluster analysis that reveals three main character groups based on specific answers exemplified by scores from 0 to 10. The "restless" are the angriest children, who show lower self-esteem and find it difficult to contain anger and respond to evil rationally. The "curious" are the most open, are eager to learn, interested in the stories and opinions of others - even when they do not share them - and are very sociable. Finally, the "conscientious" are precise, scrupulous, and eager to learn too; they show a good deal of trust in others because they believe that others behave like them.

At the level of distribution among the character groups, approximately 50% of the sample falls into the "restless" group. Males are more represented among the "curious"; and females, among the "conscientious." High school kids appear more frequently among the "restless" and "curious" (as might be expected at their age), whereas middle school kids are overrepresented among the "conscientious." Openness and restlessness are growing functions with the age of the respondents.

The second section of the questionnaire contains four questions aimed at capturing knowledge and sensitivity to environmental issues. It includes questions on knowledge of the problem of global warming, personal commitment to the fight against waste and global warming, value judgments about the responsibilities of adults, and the effectiveness of the role of governments in addressing environmental sustainability. From Table 4, section A, approximately 80% of the sample attributes values higher than 6 (on a scale from 0 to 10) to the possibility of making a difference to reduce global warming and waste. As many as 64% of the sample believes that the responsibility of adults in the current situation of environmental degradation is high, assigning a score between 8 and 10. The opinion on the possibility that governments can act to encourage a change of habits is more evenly distributed, with 70% of the sample assigning it a value higher than 6.

The third section of the questionnaire contains questions on practices associated with the use of money. Six questions (Table 4, section B) assess access to money to be managed independently and the habits associated with the use of the available sums: from planning to the ability to renounce what is superfluous and to the generosity of spirit. The availability of periodic money (i.e., allowances) concerns only a quarter of the sample, with a higher prevalence of males than females. If money is available, the students declare that they pay attention to its use and that they save by thinking about the realization of a project (77%). Furthermore, approximately 77% declares to know how to keep unnecessary expenses under control (giving themselves a grade higher than 6, with 47% of them being convinced that they deserve a grade between 8 and 10) and 63% declares to be particularly

satisfied when, after having set aside some money, they manage to buy what they want. In the sample, a certain degree of individualism prevails, which leads to use money above all for the personal happiness, even if the girls are slightly more altruistic and attribute an average value of 5 for themselves rather than 6, which is the males' average score.

The fourth section of the survey contains information on the parenting model and the use of digital media such as *social media* and video games. It allows us to understand the ability of parents to be *role models* for their children and the extent to which the use of *social media* and video games can influence the decisions of children regarding issues such as the use of scarce resources. Parents remain a point of reference for children. Of the young people, 82% answered "a lot" or "enough" to the question of how much of a role model in the management of environmental resources their parents are, while the percentage increases to 91% when the question is related to the management of economic resources. At the character level, the conscientious feel closest to the parental model (89.7% and 96.6%). Regarding the use of *social media*, 91% of the girls spend time on *social media* every day versus 79% of males and 80% of boys (against 31% of the girls) are more attracted to video games and play them daily.<sup>1</sup> It is important to recall that the use of *social* platforms is important for the youngest to access the world and collect information, as shown in a recent survey by the PEW Research Center, which refers to the case of the United States (Shearer and Mitchell, 2021).

## Methodology

To assess the degree of awareness of the use of scarce resources, two synthetic indicators were constructed, which we use as a proxy for environmental awareness (GREEN INDEX) and economic awareness (MONEY INDEX), in the form of weighted averages of the answers to the questions in the second and third sections of the questionnaire (presented briefly in Table 4). The weight values were obtained using the principal components analysis (PCA). The use of multivariate statistical techniques for the construction of synthetic indicators is widespread in the literature (Vyas and Kumaranayake, 2006; Filmer and Pritchett, 2001). Of course, the choice of questions to be aggregated lends itself to different interpretations. However, the flexibility of this methodology in the case of items with categorical variables for answers to subjective questions makes the analysis particularly useful and has hundreds of applications in the social science literature (Poirier JM, Grepin KA, Grignon M., 2020).

The GREEN INDEX indicator uses the coefficients of the first main component (i.e., vectors 0.27, 0.28, 0.22, and 0.23) to weigh the answers to questions (1), (2), (3), and (4), which are reported in section A of Table 4. The four questions relate only to environmental awareness. For the MONEY INDEX, given the nature of the questions, the synthetic index is constructed in two steps. The answers to questions (8), (9), and (10), reported in Table 4 and related to the availability of personal money, are grouped with the arithmetic mean.<sup>1</sup> This value is then used to estimate the principal components of a vector, which also include the answers to questions (5), (6), and (7) also related to money decisions. The synthetic value was obtained using the coefficients of the first principal component (0.21, 0.33, 0.11, and 0.35) to weigh the vector formed by the average value of the answers to questions (8), (9), and (10) and the single answers to questions (5), (6), and (7).

The distributions of the two synthetic indexes are shown in Table 5. The highest values of both indexes are achieved by the so-called "conscientious" children; and the lowest values, by the "restless".

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<sup>1</sup> Data on the use of social media and video games are available upon request and can be downloaded at the following link [https://www.museodelrisparmio.it/wp-content/uploads/2021/04/R.21.101-Museo-del-Risparmio\\_Report\\_REV05-002.pdf](https://www.museodelrisparmio.it/wp-content/uploads/2021/04/R.21.101-Museo-del-Risparmio_Report_REV05-002.pdf)

These differences are statistically significant according to the adjusted Wald test. On the contrary, the differences between males and females based on the same test are not statistically relevant. The "conscientious" type is associated with the highest average values of the two indexes, followed by the "curious." The lowest average values (albeit higher than 6) are associated with the "restless."

Table 6 shows an interesting fact: 48.5% of the youngsters who fall into the fourth quartile of the economic awareness index also belong to the top quartile of the environmental awareness index. This evidence also characterizes the lowest quartile and shows a close relationship between the two types of awareness at both extremes. The average correlation between the indexes is 41%.

MONEY INDEX and GREEN INDEX represent the two proxy dependent variables of the degree of awareness of the use of scarce environmental and economic resources, which can be considered the latent variable. The research idea is to infer how sociocultural status, family, school, and characteristics affect the degree of awareness.

We started by first estimating linear sample regressions for each synthetic indicator. Four models, from the simplest to the most complex, were computed. Many coded answers in the questionnaire, together with some fixed regionally based variables, were used as independent variables in different specifications (see Appendix, List of variables).

Linear equations can be briefly represented as follows:

$$Y_{1i}^* = \alpha_{1i} X_{i1} + \gamma_1 Y_{2i} + \varepsilon_{1i} \quad (1)$$

$$Y_{2i}^* = \alpha_{2i} X_{i2} + \gamma_2 Y_{1i} + \varepsilon_{2i} , \quad (2)$$

where  $Y_{1i}^*$   $Y_{2i}^*$  are the latent variables of economic and environmental awareness approximated to the synthetic indicator MONEY INDEX and GREEN INDEX,  $X_{in}$  is the explanatory variable,  $\alpha_{ni}$  is the vector of the coefficients, and finally,  $\varepsilon_{ni}$  is the error term assumed to be distributed as a normal standard  $\varepsilon_{ni} \sim N(0,1)$ , with  $n = 1,2$ .

The next step was to estimate the probability of falling into the different quartiles of the indexes through two distinct ordered probits. In this case, each dependent variable  $Y_{ni}^*$ , where  $n = 1,2$ , can take on four values from 1 to 4, as coded below:

$$\left\{ \begin{array}{l} = 1 \text{ se } 0 \leq Y_n^* \leq \mu_1 \\ = 2 \text{ se } \mu_1 < Y_n^* \leq \mu_2 \\ = 3 \text{ se } \mu_2 < Y_n^* \leq \mu_3 \\ = 4 \text{ se } \mu_3 < Y_n^* \leq \mu_4, \end{array} \right. \quad (3)$$

where  $\mu_1, \mu_2, \mu_3, \mu_4$  are the threshold values identified respectively as the first, second, third, and fourth quartiles of the distribution of  $Y_{ni}$ .

It is therefore possible to estimate the values of the coefficients  $\alpha_{ni}$  in the three cutoff terms  $k_n$  and, consequently, the probability that  $Y_{ni}$  assumes the values 1, 2, 3, and 4 using the standard formulas of the ordered probit.

We are aware of endogeneity concerns regarding the correlation between the dependent variables and the residuals, which makes it impossible to isolate a causal relationship between the explanatory variables and the dependent variables. Nonetheless, since the analysis is functional to the following identification strategy and we base policy suggestion on the statistical association between



environmental sensitivity and money management, we do not proceed further with the 2-step procedure to correct for the bias.

The final step was to focus attention on the top performers and consider that a correlation may exist between the error terms, given the importance of what we defined as cross-awareness. For this reason, we decided to adopt a bivariate probit estimate (biprobit) that allows simultaneous modeling of two dependent variables related to each other. In this case, cross-awareness was not included in the exogenous list.

The bivariate probit model follows Greene's (2017) formula:

$$Y_{1i} = \alpha_{1i} X_{i1} + \varepsilon_{1i}, \quad Y_{1i} = 1 \text{ se } Y_{1i}^* > \mu_{13}, 0 \text{ otherwise}$$

$$Y_{2i} = \alpha_{2i} X_{i2} + \varepsilon_{2i}, \quad Y_{2i} = 1 \text{ se } Y_{2i}^* > \mu_{23}, 0 \text{ otherwise}, \quad (4)$$

where the dependent variables assume a value of 1 if the value of the indicator composed of economic and environmental awareness falls in the fourth quartile and the error terms are expressed by the following formula:

$$\begin{pmatrix} \varepsilon_{1i} \\ \varepsilon_{2i} \end{pmatrix} \sim N \left[ \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix} \right], \quad (5)$$

where  $\rho$  is coefficient of the cross-equation correlation of errors. The econometric estimates were obtained with STATA, which allows the estimation of a two-equation model in the seemingly unrelated probit version using the maximum likelihood method. In this case, the margins are to be interpreted as the impact of each independent variable on both dependent variables or pseudo-elasticity calculated on the average values.

## Empirical results and discussion

Table 7 in sections A and B reproduces the estimate of four explanatory models (Eqs. 1 and 2) for the two synthetic indexes. The models use a similar set of explanatory variables for the two indexes.

Model 1 (M1) considers only the impact of demographic variables, the sociocultural context, the type and quality of the school, and the use of *social media* by children, making it a useful tool for collecting information from sources outside the family and school itself. The model shows a greater explanatory power of the variance for the MONEY INDEX ( $R^2 = 10\%$ ), where the SES variables,  $\text{SOCIAL}$ ,  $\text{ISTEC}$ , and  $\text{QSCHOOL}$ , are statistically significant and of the expected sign, compared with the GREEN INDEX ( $R^2 = 6\%$ ), where only the SES variable is significant and of the expected sign.

M2 and M2.A incorporate, among the explanatory variables, the character traits grouped into the three clusters described in paragraph 2. For both indexes, the PERSONALITY variable is significant and can increase the variance explained by the model by more than 4 and by approximately 9 percentage points.

By opening the clusters and considering some specific character traits, the M3 model highlights the key role of aspects such as CURIOSITY, SCRUPULOUSNESS, and CONFIDENCE for both awareness indexes. The increases in  $R^2$  range from 14 to 18 percentage points, reaching 28% and 34%,

respectively. The RELATIONSHIP WITH OTHERS or the ability to get along with even those who do not have the same ideas is significant only in the case of the MONEY INDEX.

The M4 model adds to the explanatory variables both the parental model represented by the ROLE MODEL variable (Eco/Green) and the synthetic index of cross-awareness to account for the evidence provided in Table 6. From the variance inflation factor and link tests, the introduction of this variable as an explanatory variable does not involve significant distortions but increases the explanatory power of the model by approximately 4% in the case of the MONEY INDEX and by approximately 3% in the case of the GREEN INDEX. This confirms the evidence that attention to environmental causes and money management are linked, which is our main empirical scope.<sup>100</sup> If the models are estimated by distinguishing by gender, see model 4.A and 4.B the explanatory power increases, highlighting differences in the significance of some single variable. Taken together, these differences do not affect the overall results. If anything, they offer interesting nuances. However, it should be remembered that the SEX variable is never significant in regressions, highlighting substantial uniformity between genders in terms of economic and environmental awareness.

Overall, while economic awareness (MONEY INDEX) is influenced by external contextual factors connected to family, school, use of *social media*, and personality, the structure of statistical relationships that affect environmental awareness is quite different (GREEN INDEX). In this case, the influence of context variables is residual, and that of the sociocultural condition (SES) of the family is not stable and disappears in the more complex specification (Table 7, Section B M3 and M4), where the use of *social media* appears to play a significant role as a probable source of information more for males than for females (see M4.B). Also relevant is the age structure of the opposite sign for girls and boys. The variable relating to the air quality of the region where the respondent lives (QUALAIR) does not appear to have any relevance. All the regressions reported in Table 7 show a correct specification and a substantial absence of collinearity among the regressors.

The ordinal structure of the proxy indexes of awareness offers the possibility of analyzing the impact of exogenous variables on the probability of belonging to the different quartiles and therefore on the level/degree of awareness. Table 8 presents the ordered probit estimates for the MONEY INDEX and GREEN INDEX variables transformed according to formula (3) into ordinal variables (MONEY QUARTILES and GREEN QUARTILES). They allow us to highlight clearer similarities and differences between the explanatory factors of economic and environmental awareness. The incidence of context variables on economic awareness is higher than that on environmental awareness. Some personality traits such as CURIOSITY, SCRUPULOUSNESS, and CONFIDENCE exert a significant impact. The role of parents stands (ROLE MODEL) on the value of both economic and environmental awareness, in line with the response rates reported in paragraph 2,<sup>101</sup> and the relevance of cross-awareness is beyond doubt. We emphasize that the structure of significance remains unaffected if cross-awareness is not included in the regression.

Based on the results of the analysis of the marginal effects, as reported in Table 9, we can state that the probability of falling into the four quartiles is a function of the exogenous variables identified as relevant. For example, a family's good sociocultural status increases the probability of falling into the fourth quartile by 3% (i.e., in the class where the awareness is highest). Symmetrically, a low social status increases the probability of being in the first quartile by 3% (among those with the lowest degree of awareness). School quality also increases the likelihood of being in the top quartile by 6%. Among the personality traits, CURIOSITY has the highest impact (3.2% for environmental awareness and 2.5% for economic awareness), followed by SCRUPULOUSNESS (2.4% and 1.6%, respectively). The difference in the marginal effect of CONFIDENCE is similarly measured (2.6% and 1.6%, respectively).

The level of SELF-ESTEEM also affects economic awareness in probabilistic terms; that is, higher self-esteem increases the probability of being among the most aware by 1.1%. Cross-awareness is relevant in both specifications, with a symmetrical impact in terms of probability of approximately 7%.

Finally, to analyze further the impact of the exogenous variables on the last quartile (i.e. on the highest level of awareness), the GREEN INDEX and the MONEY INDEX variables were estimated using a bivariate probit, represented by equation (4). The results are reported in Table 10, where the dependent variables assume values  $[1, 0]$ , depending on whether the value of the synthetic indexes falls into the highest quartile of the distribution. They are called MONEY TOP and GREEN TOP. The estimation of the coefficient of equation (5) confirms the advisability of jointly estimating the two regressions. It takes on a value of 0.40 and is highly significant. The significance of the variables was largely confirmed for both specifications.

Finally, Table 11 presents a joint estimate of the marginal impact of the explanatory variables when a bivariate probit is implemented. A non-secondary role of age is evident in the 14- and 18-year-olds being more sensitive to both issues (with a marginal effect of approximately 8 percentage points). The impact of the character aspects, such as CURIOSITY, SCRUPULOUSNESS, CONFIDENCE, and RELATIONSHIP WITH OTHERS, brings about a 2% increase in the probability of being among the top performers.

## Conclusions

This study examines the statistical relationship between environmental awareness and the attitude of Generation Z toward the use of money in Italy through a representative sample of the population composed of 400 youngsters, which is an original dataset and a relevant contribution to a literature that lacks many direct investigations among this specific segment of the population.

Even within the context in which sustainability is an increasingly central issue in the agenda of both the policymakers and the corporate world, we did not find previous studies that investigate the relationship between these two dimensions. We believe that this research is promising because of the possible spillover effects that can translate into specific policy orientations.

The empirical analysis was conducted starting from the construction of two synthetic indicators using the principal components analysis. MONEY INDEX and GREEN INDEX capture awareness about the use of money and the exploitation of environmental resources, respectively.

Both indicators have been used in different econometric specifications as dependent variables to explain which factors correlate with them and to determine whether the two variables have some elements in common.

A simple correlation between the GREEN INDEX and MONEY INDEX - equal to 0.41 and significant at 1% - shows a clear statistical association between the two dimensions, later confirmed in the econometric analysis. The probability of belonging to the last quartile of the environmental sustainability indicator is also strictly connected to that of belonging to the last quartile of respondents that showed to be the most responsible in the use of money.

As for the variables that correlate with the two indexes, some common features and differences emerged.

Character traits have a significant impact on both dimensions, with the propensity to show trust in others and curiosity playing the most important roles. Young people who show greater confidence and curiosity are also more likely to be more aware of environmental issues and to use their money more responsibly. Scrupulousness and sociability have also positive impacts on both indexes. Fostering these personality features during childhood development can create a fertile ground for adopting behaviors coherent with the 2030 goals of future generations.

The main differences between the two indexes are in the role of external context variables. If the cultural background of the family has a significant impact, and with the expected sign, on the propensity to use money responsibly (higher levels of cultural background correspond to higher levels of money awareness), such an effect is not significant for environmental awareness.

The role of the parents as a *role-models* and the type of school is more relevant for the use of money, while they have a residual impact on environmental sensitivity. A possible explanation could lie in the fact that the use of money, for many young people, represents a practical skill that they already exercise managing small personal sums, or that they observe closely in the family. Conversely, environmental issues are trend topics on social media and information channels, thus youngsters may well have external role models to follow, and this may mitigate the role of the family in this regard.

Due caution must be exercised when interpreting the data. The present survey provides a significant statistical association, but we believe that more insights can be gained from further research aimed at more clearly isolating the causal link between the two dimensions. Our data consent to measure with a certain degree of precision a correlation coefficient. Nonetheless, the spillover between the two dimensions is a useful indication for educators and policymakers, and it can translate into the efficient use of public monetary funds to achieve a dual purpose.

If training on the responsible use of money is also associated with greater environmental awareness, it can be a formidable tool for sustainable education according to the 360° definition of sustainability that also emerges from frameworks such as the UN 2030 Agenda.

## APPENDIX

### Variables' list

<i>First name</i>	<i>Description</i>	<i>Average</i>	<i>Source</i>	<i>Note</i>
MONEY INDEX	Synthetic economic awareness indicator	6.90	In-house calculation	See paragraph 3
GREEN INDEX	Synthetic indicator of environmental awareness	6.88	In-house calculation	See paragraph 3
SEX	Gender of the interviewee	1.48	Survey	Variable [1, 2]
AGE	Age of the interviewee	15 and 1/2	Survey	Variables [1–6] 1 = 13; ...; 6 = 18
SES	Family cultural background	1.42	In house calculation	The weighted average of each parent's educational qualification and the number of books in the home. See note 7
SOCIAL	Use of social channels	0.85	Survey	Variable [0.1]
ISTEC	School type, technical institute	0.42	Survey	Variable [0.1]
QSCHOOL	School quality	11	ISTAT (May 2021)	Average of the median grades of the high school diploma of I and II degrees by region in 2019 - regional data
QUALAIR	Air quality	37.78	National System for Environmental Protection	Number of stations with a 50-µg/m <sup>3</sup> limit exceedance for PM10 in 2020 - regional data
PERSONALITY	Character cluster	1.75	In house calculation	The variable that takes a value of 1 for the restless, 2 for the curious, and 3 for the conscientious
SELF-ESTEEM	Assertion evaluation: "Sometimes I feel like I'm not worth much."	5.40	Survey	Variable [0.10]
CURIOSITY	Assessment of the claim: "I like lessons where I learn something new that I didn't know before."	7.68	Survey	Variable [0.10]
RELATIONSHIP WITH OTHERS	Assessment of the claim: "I try to get along with people even when they don't have my ideas."	7.11	Survey	Variable [0.10]
SCRUPULOUSNESS	Evaluation of the claim: "I am very attentive and thorough when I do my school homework."	6.68	Survey	Variable [0.10]
HUMOR	Assessment of the claim: "My mood depends a lot on the judgment of others."	5.05	Survey	Variable [0.10]
CONFIDENCE	How much do you think others can be trusted?	5.74	Survey	Variable [0.10]
FRIENDSHIP	How many people are you able to talk to about your intimate and private matters?	2.85	Survey	Variable [1,6] [none, 1, 2, 3, 4–6, 7+]
ROLE MODEL/eco	How inspired are you by your parents? How much of a role model for money	1.69	Survey	Variable [1.4] [much, enough, little, not at all]

	management are they to you?			
ROLE MODEL/green	How inspired are you by your parents? How much of a role model for the management of environmental resources are they to you?	1.89	Survey	Variable [1.4] [much, enough, little, not at all]

1

<sup>[1]</sup>References to technical reports published by OECD are available at this [link](#).

<sup>[2]</sup>The survey was conducted among a representative sample of 2000 adults aged between 18 and 79.

<sup>[3]</sup>Here is the [link](#) to the European Social Survey website.

<sup>[4]</sup>In the field, the investigation was conducted by Episteme. Thirteen-year-olds completed the questionnaire in the presence/with the help of their parents under the provisions of the law enforced. The sample was representative of the Italian population, stratified by age and geographical residence.

<sup>[5]</sup>The sample size is equivalent to those in other published studies on Generation Z.

<sup>[6]</sup><https://www.europeansocialsurvey.org/data/themes.html?t=personal>

<sup>[7]</sup>Table 3 does not report two questions included in the section on personality traits because they are not relevant to the cluster analysis that divided children into three main groups. Specifically, the questions are: "How often do you meet your friends outside of school?" (the possible answers go from daily to less than once or twice a week) and "How many people do you talk to about your most intimate and private things?" (the answers go from none to more than 7). The answers show a distinct lack of sociability, with a third (34%) of the sample not dating friends outside their school even once a week, more than a third (36%) of the sample having at most two close friends, and 37% having no friends or with only one close friend. These responses seem to be affected by the confinement imposed by the pandemic situation associated with the spread of coronavirus disease.

<sup>[8]</sup>The PCA on the first answers (8), (9), and (10) gives results equivalent to the arithmetic mean.

<sup>[9]</sup>The SES variable is constructed as a weighted average using the weights of the first component (0.6216, 0.6173, and -0.4783) of the following responses on maternal education level (1 = undergraduate or postgraduate, ..., 6 = no formal education), paternal education level (1 = graduate or post-university, ..., 6 = no formal education), and the number of books available at home (1 = 0-10, ..., 6 = more than 500). In line with the construction of the variable, low values indicate a high sociocultural context.

<sup>[10]</sup>Excluding the cross-awareness index, the results of the regression did not change from a qualitative point of view. However, the percentage of explained variance was lower.

<sup>[11]</sup>The role of parents deserves further study. If we replace the variable with a dummy [0,1] in correspondence with the answer "a lot" in the case of economic awareness, the positive role of parents will stand out clearly, with a significance of 5% in the linear regression and 10% in forms probit with a significant marginal effect of 5 percentage points. It was not relevant in the linear regression for green awareness but became relevant in the oprobit and biprobit estimates, where the coefficients must be read as a variation from the baseline value corresponding to 1 = "a lot".

## References

- Bamber, S. and Moser, G., 2007, Twenty Years after Hines, Hungerford, and Tomera: A New Meta-Analysis of Psycho-Social Determinants of Pro-environmental Behaviour, *Journal of Environmental Psychology*, 27, 14-25.
- Bollani, L., Bonadonna, A. and Peira, G., 2019, The Millennials' Concept of Sustainability in the Food Sector. *Sustainability*, 11, 2984. <https://doi.org/10.3390/su11102984>
- Breßler, J. and Kappler, S., 2017, A Systematic Review of Education for Sustainable Development, *Chemnitz Economic Papers*, No. 007, Chemnitz University of Technology, Faculty of Economics and Business Administration, Chemnitz.
- Cho, M., Bonn, M.A., and Han, S.J., 2018, Generation Z's Sustainable Volunteering: Motivations, Attitudes and Job Performance. *Sustainability*, 10, 1400. <https://doi.org/10.3390/su10051400>
- D'Alessio, G., De Bonis, R., Neri, A. and Rampazzi, C., 2020, L'Alfabetizzazione Finanziaria degli Italiani: i Risultati dell'Indagine della Banca d'Italia del 2020, *Questioni di Economia e Finanza (Occasional Papers)*, Banca d'Italia, #588.
- Filmer, D. and Pritchett, L.H., 2001, Estimating Wealth Effect Without Expenditure Data – or Tears: An Application to Educational Enrollments in States of India, *Demography*, 38, 115-132.
- Greene, H.W., 2017, *Econometric Analysis*, Eighth Edition Pearson Educational International, Upper Saddle River, NJ.
- LeBaron, B. A., Holmes E.K., Lorgensen B.L. and Bean, R.A., 2020, Parental Financial Education During Childhood and Financial Behaviors of Emerging Adult, *Journal of Financial Counseling and Planning* 31(1), 31, 42-54
- Li, J. and Leonas, K.K., 2022, Generation Z Female Consumers' Preferences for Swimwear Products with Sustainability-Relevant Attributes, *Journal of Global Fashion Marketing*, 13, 44-60, <https://doi.org/10.1080/20932685.2021.1960580>
- List, M.K., Schmidt, F.T.C., Mundt, D. and Foste-Eggers, D., 2020, Still Green at Fifteen? Investigating Environmental Awareness of the PISA 2015 Population: Cross-National Differences and Correlates, *Sustainability*, MDPI, Open Access Journal, 12, 1-20.
- Matthews, G., Deary, I. J., and Whiteman, M. C., 2003. *Personality traits* (2nd ed.). Cambridge University Press. <https://doi.org/10.1017/CBO9780511812736>
- McAdams, D.P., 1992, The Five-Factor Model in Personality: A Critical Appraisal, *Journal of Personality*, 60, 329-61.
- McCoy, L., Wang, Y.-T. and Chi, T., 2021, Why Is Collaborative Apparel Consumption Gaining Popularity? An Empirical Study of US Gen Z Consumers. *Sustainability*, 13, 8360. <https://doi.org/10.3390/su13158360>
- Olszewski-Kubilius, P., Worrell, F. C, and Subotnik, R. F., 2018, The Role of the Family in Talent Development. In Pfeiffer, S. I., Shaunessy-Dedrick, E. and Foley-Nicpon M. (Eds.), *APA Handbook of Giftedness and Talent*, 465–477. American Psychological Association. <https://doi.org/10.1037/0000038-030>
- Poirier, J.M., Grepin, K.A. and Grignon, M., 2020, Approaches and Alternatives to the Wealth Index to Measure Socioeconomic Status Using Survey Data: A Critical Interpretive Synthesis, *Social Indicators Research*, 148, 1–46.
- Samuelsson, I.P. and Park, E., 2017, How to Educate Children for Sustainable Learning and for a Sustainable World, *International Journal of Early Childhood*, 49, 273–285.

Shearer, E. and Mitchell, A., 2021, News Use Across Social Platforms in 2020, Pew Research Center, January.

Sommerville, M. and Williams, C., 2015, Sustainability Education in Early Childhood: An Updated Review of Research in the Field, *Contemporary Issues in Early Childhood*, 16, 102–117.

Thomas, G.O., Fisher, R., Whitmarsh, L., Milfont, T.L. and Poortinga, W., 2018, The Impact of Parenthood on Environmental Attitudes and Behaviour: A Longitudinal Investigation of the Legacy Hypothesis. *Population and Environment*, 39, 2018;3261-276. doi: 10.1007/s11111-017-0291-1. Epub 2017 Dec 18. PMID: 29568145; PMCID: PMC5846977.

Vyas, S. and Kumaranayake, L., 2006, Constructing Socio-Economic Status Indices: How to Use Principal Components Analysis, *Health Policy and Planning*, 21, 459–468.

White, J., McCoy, M. and Watkins, K., 2018, Exploring the Relationship between Sustainability and Personal Finance, *The Forum Journal*, 22, 1-12.



**Table 1 Demographic features (sample of 400 young Italians aged between 13-18)**

Percentage Values

	Sex	School		Type of High School		Preferred Subjects		
		Middle	High	Lyceum	Technical	Humanities	Scientific	None
Male	51.6	19.4	80.6	28.6	71.4	20.3	54.7	25.0
Female	48.4	15.0	85.0	45.7	54.3	43.5	32.3	24.2

Age		Area		Number of Inhabitants	
13	16.7	N-W	25.8	up to 10k	26.0
14	16.6	N-E	19.1	10-30k	23.5
15	16.8	CE	18.9	30-100k	24.5
16	16.6	S-I	36.1	100-500k	14.6
17	16.6			>500K	11.5
18	16.8				

**Table 2 Family cultural background**

Percentage Values

Qualification	Parents	Father	Mother
Bachelor's degree or more (2)	13.9		
Bachelor's degree or more (1)	18.7	22.5	23.6
High School Diploma (2)	26.5		
High School Diploma (1)	20.3	40.0	47.7
Lower Licences	20.7	37.5	28.7
<i>How many books do have you at home?</i>			
0-10	12.28		
11-25	18.73		
26-100	30.76		
101-200	22.64		
201-500	10.45		
more	5.14		

**Table 3 Personality Traits**

Section A. Average Value [range 0-10]	Tot	Restless	Curious	Conscientious	
I often lose control, and I am quick to anger	4.7	<b>6.2</b>	3.2	3.2	
There are events that I do not like and that make me angry	6.7	<b>6.9</b>	6.5	6.4	
Sometimes I feel like I'm not worth much	5.4	<b>6.5</b>	4.6	4.1	
If someone says something bad about me I reply immediately by saying something nasty	5.2	<b>6.4</b>	3.7	4.2	
I like lessons where I learn something new that I didn't know before	7.7	6.8	<b>8.7</b>	8.5	
I'm interested in stories of people living in other countries of the world	6.4	5.9	<b>7.6</b>	6.5	
I try to get along with people, even when they don't have my ideas	7.1	6.3	<b>8.2</b>	7.6	
It's easy to socialize with me	7.2	6.3	<b>8.5</b>	7.8	
I like reading different kinds of books (essays, novels, comics)	5.5	4.9	4.9	<b>7.4</b>	
I always finish everything I start	6.6	5.7	6.8	<b>8.1</b>	
I'm very attentive and thorough when I do my school homework	6.7	5.9	6.6	<b>8.4</b>	
I tidy up everything I use as soon as I finish using them	6	5.4	5.4	<b>7.7</b>	
In general, how much do you think you can trust people?	5.7	5.5	5.4	<b>6.5</b>	
	Section B. Percentage Values	Tot	Restless	Curious	Conscientious
	Male	51.6	51.3	54.2	49.7
	Female	48.4	48.7	45.8	50.3
	High School	17.3	14.5	14.2	25.8
	Middle School	82.7	85.5	85.8	74.2
	North-West	25.8	24.2	25.8	29.1
	North-East	19.1	23.7	16.9	12.5
	Centre	18.9	19.3	20.5	16.6
	South and Islands	36.1	32.8	36.9	41.8

**Table 4 Components of the synthetic indexes (row percentage)**

Section A. Vote [range 0-10]	<i>Components Green Index</i>		
score	[0-5]	[6-7]	[8-10]
Make the difference (1)	0.22	0.38	0.40
Personal commitment (2)	0.24	0.40	0.36
Adults' responsibility (3)	0.11	0.25	0.64
Government action (4)	0.29	0.39	0.32
Section B. Vote [range 0-10]	<i>Components Money Index</i>		
score	[0-5]	[6-7]	[8-10]
Expenses under control (5)	0.23	0.30	0.47
For my own happiness (6)	0.38	0.33	0.20
Satisfaction (7)	0.11	0.26	0.63
Money at disposal (8)	Periodically	Occasionally	None
	0.25	0.43	0.32
Think about how to use money (9)	Yes		No
	0.85		0.15
Reasons to save (10)	Project	Fear	By chance
	0.77	0.10	0.13

**Questions:**

- (1) How much do you think that your daily attitude can make a difference to reduce global warming?
- (2) How much do you feel personally committed to reducing the problem of waste of natural resources?
- (3) How severe do you believe the impact of the lack of attention to sustainability themes by adults will be?
- (4) How likely do you believe that Governments might act to change the world development model so that it becomes more sustainable over time?
- (5) I keep my expenses under control and, if something is not necessary, I avoid buying it
- (6) My money is used only and exclusively for my happiness, without thinking about the impact it can generate on others
- (7) If you want something you like, and you cannot afford it immediately, how much satisfaction do you feel in being able to buy it when you reach the needed amount?
- (8) Do you usually have money at your disposal?
- (9) If you have money at your disposal, do you have the habit of thinking about how to use it?
- (10) Why do you save money?

**Table 5 Respondents' evaluation of the relevance of environmental and economic sustainability**

Percentage values	x <=2	>2 x <=3	>3 x <=4	>4 x <=5	>5 x <=6	>6 x <=7	>7 x <=8	>8 x <=9	>9 x <=10
Green Index	0.75	1.25	2.00	8.25	13.00	27.70	24.25	17.75	5.00
Money Index		1.75	3.50	7.75	15.50	20.50	23.75	18.25	9.00
Average value [range 0-10]	Mean	Std.Dev.	Min	Max	Male	Female	Restless	Curious	Consc.
Green Index	6.88	1.53	0.00	10.00	6.91 (a)	6.87 (a)	6.49(b)	7.17(c)	7.38(d)
Money Index	6.90	1.61	2.43	10.00	6.82 (e)	6.91 (e)	6.37(f)	7.01(g)	7.65(h)

Average value [range 0-10]	Mean				Std. Dev.			
	1° quartile	2° quartile	3° quartile	4° quartile	1° quartile	2° quartile	3° quartile	4° quartile
Green Index	4.88	6.52	7.44	8.67	0.12	0.03	0.03	0.05
Money Index	4.75	6.43	7.56	8.86	0.09	0.04	0.03	0.05

**Adjusted Wald test:**

- (a) Male=Female adj. Wald test 0.07 (p=0.7880)
- (b) Restless=Curious adj. Wald test 11.22 (p=0.0009)
- (c) Restless=Conscientious adj. Wald test 23.06 (p=0.0000)
- (d) Curious=Conscientious adj. Wald test 0.93 (p=0.3347)
- (e) Male=Female adj. Wald test 0.31 (p=0.5751)
- (f) Restless=Curious adj. Wald test 11.99 (p=0.0006)
- (g) Restless=Conscientious adj. Wald test 56.66 (p=0.0000)
- (h) Curious=Conscientious adj. Wald Test 10.56 (p=0.0013)

**Table 6 Joint presence by quartile (percentage values)**

		Green Index			
		4° quartile	3° quartile	2° quartile	1° quartile
Money Index	4° quartile	<b>48.5</b>	26.6	11,7	13.4
	3° quartile	21.1	38.2	25.2	15
	2° quartile	20.7	23.6	25.6	28
	1° quartile	9.6	11.6	37.6	<b>43.6</b>

**Table 7 Survey Linear Regressions**

Section A. Dependent Variable MONEY INDEX

	M1		M2		M2.A		M3		M4		M4.A		M4.B	
Exogenous Variables	Coeff	St.Error	Coeff	St.Error	Coeff	St.Error	Coeff	St.Error	Coeff	St.Error	<i>(femmine)</i>		<i>(maschi)</i>	
											Coeff	St.Error	Coeff	St.Error
SEX	0.0563	0.1688	0.0650	0.1646	0.0711	0.1643	-0.0193	0.1518	-0.0344	0.1476				
AGE	0.0743	0.0479	0.0723	0.0475	0.0680	0.0480	0.0943	0.0486 **	0.0801	0.0472 *	0.106795	0.0660	0.0497	0.0670
SES	-0.2755	0.0547 ***	-0.2417	0.0549 ***	-0.2420	0.0550 ***	-0.1459	0.0518 ***	-0.1341	0.0466 ***	-0.1728	0.0610 ***	-0.0990	0.0681
SOCIAL	0.4962	0.2464 **	0.4897	0.2388 **	0.4723	0.2373 **	0.3891	0.2171 *	0.4559	0.2190 **	-0.0883	0.3940	0.7117	0.2524 ***
ISTEC	0.3671	0.1777 **	0.4738	0.1746 ***	0.4740	0.1746 ***	0.4369	0.1649 ***	0.4611	0.1547 ***	0.3717	0.1959 *	0.6022	0.2220 ***
QSCHOOL	0.5214	0.1951 ***	0.4833	0.1912 **	0.4794	0.1913 **	0.3162	0.1770 *	0.3296	0.1720 *	0.1414	0.2213	0.3000	0.2585
PERSONALITY			0.4216	0.0895 ***										
	2				0.5533	0.1929 ***								
	3				0.8168	0.1800 ***								
SELF-ESTEEM							0.0353	0.0300	0.0406	0.0285	0.0790	0.0425 *	0.0061	0.0410
CURIOSITY							0.1616	0.0461 ***	-0.1067	0.0470 **	0.0519	0.0637	0.1161	0.0710
RELATIONSHIP WITH OTHERS							0.1167	0.0459 **	0.1014	0.0442 **	0.1126	0.0557 **	0.1318	0.0629 **
SCRUPULOUSNESS							0.1094	0.0369 ***	0.0686	0.0366 *	0.0637	0.0488	0.0841	0.0527
HUMOR							-0.0323	0.0355	-0.0416	0.0343	-0.1115	0.0482 **	0.0208	0.0445
CONFIDENCE							0.1121	0.0410 ***	0.0765	0.0409 *	0.0597	0.0528	0.1034	0.0520 **
FRIENDSHIP							0.0464	0.0642	0.0266	0.0605	0.0234	0.0873	0.0164	0.0818
ROLEMODEL/Eco							-0.1599	0.1166	-0.1551	0.1120	0.0894	0.1429	-0.3377	0.1645 **
GREEN INDEX									0.2507	0.0601 ***	0.3821	0.0811 ***	0.1336	0.0764 *
CONS	0.6204	2.1559	0.2055	2.1325	0.6649	2.1253	-0.5358	2.0320	-1.3385	1.9896	0.4450	2.5540	-0.8073	3.0117
R2	0.0993		0.1436		0.1451		0.2804		0.3184		0.3741		0.3398	
F(ve,dof)	6.6 ***		8.68 ***		7.94 ***		11.00 ***		13.56 ***		12.27 ***		8.51 ***	
LINKTEST	NO		NO		NO		NO		NO		NO		NO	
VIF									1.61					

[LINKTEST NO means that the single-equation model is specified correctly; ve= number of exogenous variables, dof=degrees of freedom; VIF = Variable inflation factors test for the presence of multicollinearity; \*\*\* p<0.01; \*\*p<0.05; \* p<0.10]

Section B. Dependent Variable GREEN INDEX														
	M1		M2		M2.A		M3		M4		M4.A		M4.B	
Exogenous Variables	Coeff	St.Error	Coeff	St.Error	Coeff	St.Error	Coeff	St.Error	Coeff	St.Error	<i>(femmine)</i>		<i>(maschi)</i>	
											Coeff	St.Error	Coeff	St.Error
SEX	0.0980	0.1667	0.1098	0.1582	0.1103	0.1584	0.0591	0.1360	0.0582	0.1317				
AGE	0.0337	0.0469	0.0311	0.0445	0.0307	0.0444	0.0553	0.0405	0.0398	0.0396	-0.0968	0.0490 **	0.1403	0.0565 **
SES	-0.1991	0.0583 ***	-0.1534	0.0567 **	-0.1535	0.0568 ***	-0.0480	0.0521	-0.0145	0.0475	-0.0095	0.0546	0.0165	0.0686
SOCIAL	-0.0674	0.2211	-0.0761	0.2091	-0.0776	0.2088	-0.2814	0.1597 *	-0.3521	0.1628 **	-0.1544	0.2283	-0.5203	0.2219 **
ISTEC	-0.2520	0.1767	-0.1080	0.1707	-0.1080	0.1707	-0.0947	0.1530	-0.1993	0.1458	-0.2247	0.2188	-0.1902	0.1995
QSCHOOL	0.1766	0.1899	0.1252	0.1816	0.1249	0.1811	-0.0068	0.1965	-0.0886	0.1960	0.2388	0.2470	-0.3186	0.2898
PERSONALITY			0.5688	0.0823 ***										
	2				0.5803	0.1779 ***								
	3				1.1353	0.1647 ***								
SELF-ESTEEM							-0.0212	0.0301	-0.0266	0.0284	0.0120	0.0450	-0.0668	0.0341 *
CURIOSITY							0.2198	0.0465 ***	0.1825	0.0462 ***	0.3014	0.0536 ***	0.0605	0.0603
RELATIONSHIP WITH OTHERS							0.0598	0.0418	0.0348	0.0403	-0.0495	0.0492	0.1179	0.0671 *
SCRUPULOUSNESS							0.1631	0.0391 ***	0.1372	0.0380 ***	0.0804	0.0461 *	0.2168	0.0537 ***
HUMOR							0.0369	0.0311	0.0441	0.0297	0.0427	0.0462	0.0436	0.0364
CONFIDENCE							0.1429	0.0378 ***	0.1166	0.0372 ***	0.0511	0.0420	0.1662	0.0545 ***
FRIENDSHIP							0.0794	0.0616	0.0654	0.0580	0.0756	0.0822	0.0830	0.0748
QUALAIR							0.0021	0.0042	0.0015	0.0041	0.0020	0.0061	0.0005	0.0053
ROLEMODEL/green							-0.0035	0.1042	-0.0359	0.1006	0.0375	0.1174	-0.1454	0.1536
MONEY INDEX									0.2110	0.0488 ***	0.2928	0.0671 ***	0.1134	0.0629 *
CONS	5.0958	2.1243	4.5360	2.0296	5.1081	2.0216	2.6153	2.3534	3.0782	2.3354	-0.6270	2.8184	6.0181	3.5409 *
R2	0.0619		0.1502		0.1502		0.3390		0.3741		0.4570		0.4086	
F(ve,dof)	2.05 ***		8.75 ***		7.71 ***		8.92 ***		12.43 ***		9.67 ***		10.55 ***	
LINKTEST	NO		NO		NO		NO		NO		NO		NO	
VIF									1.58					

[LINKTEST NO means that the single-equation model is specified correctly; ve= number of exogenous variables, dof=degrees of freedom; VIF = Variable inflation factors test for the presence of multicollinearity; \*\*\* p<0.01; \*\*p<0.05; \* p<0.10]

**Table 8 Ordered Probit**

Dependent Variable	MONEY QUARTILES			GREEN QUARTILES	
	M4			M4	
Exogenous Variables					
	Coeff.	St.Error		Coeff.	St.Error
SEX	-0.0509	0.1210		0.0327	0.1197
AGE					
	14	0.3787	0.2075 *	0.0347	0.2000
	15	0.3929	0.1917 **	-0.1008	0.2061
	16	0.4922	0.1996 **	-0.1046	0.1936
	17	0.2931	0.2059	0.0413	0.2174
	18	0.3987	0.2181 *	0.1339	0.1984
SES	-0.1066	0.0390 ***		-0.0087	0.0403
SOCIAL	0.1823	0.1880		-0.1830	0.1627
ISTEC	0.3401	0.1317 **		-0.1344	0.1385
QSCHOOL	0.2420	0.1441 *		-0.0053	0.1630
SELF_ESTEEM	0.0427	0.0250 *		-0.0310	0.0265 ***
CURIOSITY	0.0948	0.0368 **		0.1244	0.0416
RELATIONSHIP WITH OTHERS	0.0837	0.0361 **		0.0487	0.0333
SCRUPULOUSNESS	0.0625	0.0309 **		0.0931	0.0331 ***
HUMOR	-0.0417	0.0286		0.0330	0.0279
CONFIDENCE	0.0596	0.0339 *		0.1007	0.0332 ***
FRIENDSHIP	0.0434	0.0501		0.0156	0.0528
QUALAIR				-0.0002	0.0036
ROLEMODEL/Eco					
	2	-0.2425	0.1261 *		
	3	-0.0613	0.2503		
	4	0.1448	0.3800		
ROLEMODEL/Green					
	2			-0.2202	0.1309 *
	3			0.0198	0.2240
	4			-0.1828	0.4124
GREEN QUARTILES	0.2830	0.0621 ***			
MONEY QUARTILES				0.2694	0.0615 ***
	cut/1	4.7821		1.7795	
	cut/2	5.6010		2.5869	
	cut/3	6.4321		3.4620	
F(ve, dof)	ve=21	dof=379	6.36***	ve=22	dof=378 5.69***

[ve= number exogenous variables, dof=degrees of freedom; \*\*\* p<0.01; \*\*p<0.05; \* p<0.10]

**Table 9 Margins Ordered Probit**  
(delta method)

Dependent Variable	MONEY QUARTILES			GREEN QUARTILES		
	Outcome 4° quartile			Outcome 4° quartile		
	Coeff.	St.Error		Coeff.	St.Error	
SEX (female)	-0.0132	0.0314		0.0084	0.0307	
AGE						
	14	0.0907	0.0508 *	0.0090	0.0517	
	15	0.0945	0.0456 **	-0.0251	0.0512	
	16	0.1219	0.0493 **	-0.0260	0.0482	
	17	0.0683	0.0485	0.0107	0.0563	
	18	0.0961	0.0533 *	0.0355	0.0526	
SES	-0.0277	0.0101	***	-0.0022	0.0103	
SOCIAL	0.0473	0.0487		-0.0469	0.0415	
ISTEC	0.0883	0.0340	***	-0.0344	0.0358	
QSCHOOL	0.0628	0.0373	*	-0.0014	0.0417	
SELF-ESTEEM	0.0111	0.0065	*	-0.0079	0.0067	
CURIOSITY	0.0246	0.0096	**	0.0318	0.0106	***
RELATIONSHIP WITH OTHERS	0.0217	0.0093	**	0.0125	0.0085	
SCRUPULOUSNESS	0.0162	0.0080	**	0.0238	0.0083	***
HUMOR	-0.0108	0.0074		0.0084	0.0071	
CONFIDENCE	0.0155	0.0087	*	0.0258	0.0085	***
FRIENDSHIP	0.0113	0.0130		0.0040	0.0135	
QUALAIR				-0.0001	0.0009	
ROLEMODEL/Eco						
	2	-0.0634	0.0334 **			
	3	-0.0168	0.0679			
	4	0.0415	0.1115			
ROLEMODEL/Green						
	2			-0.0571	0.0348	*
	3			0.0054	0.0619	
	4			-0.0479	0.1035	
GREEN QUARTILES	0.0735	0.0156	***			
MONEY QUARTILES				0.0690	0.0154	***

[\*\*\* p<0.01; \*\*p<0.05; \* p<0.10]



**Table 10 Bivariate Probit**

Dependent Variable	MONEY TOP			GREEN TOP		
	M4			M4		
Exogenous Variables						
		Coeff.	St.Error		Coeff.	St.Error
SEX		-0.0688	0.1645		0.0656	0.1602
AGE						
	14	0.8090	0.2936 ***		0.1178	0.2551
	15	0.5130	0.3087 *		-0.1108	0.2860
	16	0.5503	0.3071 *		-0.1844	0.2603
	17	0.6982	0.2996 **		0.0380	0.2699
	18	0.7725	0.3029 **		0.1452	0.2644
SES		-0.0870	0.0519 *		-0.0078	0.0601
SOCIAL		0.0025	0.2236		-0.0916	0.2086
ISTEC		0.3925	0.1745 **		-0.1957	0.1847
QSCHOOL		0.4299	0.1954 **		-0.1152	0.2098
SELF-ESTEEM		0.0379	0.0318		-0.0011	0.0322
CURIOSITY		0.1333	0.0573 **		0.1475	0.0584 **
RELATIONSHIP WITH OTHERS		0.1259	0.0503 **		0.1137	0.0517 **
SCRUPULOUSNESS		0.1160	0.0451 **		0.1018	0.0468 **
HUMOR		-0.0266	0.0356		0.0000	0.0324
CONFIDENCE		0.0443	0.0430		0.0839	0.0440 *
FRIENDSHIP		0.1209	0.0654 *		0.0171	0.0732
QUALAIR					-0.0015	0.0049
ROLEMODEL/Eco						
	2	-0.2826	0.1585 *			
	3	-0.1108	0.3952			
	4	0.3679	0.4294			
ROLEMODEL/Green						
	2				-0.4592	0.1689 ***
	3				-0.0697	0.2601
	4				-0.2832	0.6251
CONS		-9.3978	2.2851 ***		-2.2765	2.4509
F(40,360)		3.10	***			
athrho		0.4246	0.1116 ***			
rho		0.4008	0.0946 ***			

[rho = error terms cross-equation correlation cfr. Equation (6); \*\*\* p<0.01; \*\*p<0.05; \* p<0.10]

**Table 11 Margins Bivariate Probit**  
(delta method)

		M4		
		dy/dx	St.Error	z
SEX (female)		0.0001	0.0228	0.00
AGE				
	14	0.0841	0.0389	2.16 **
	15	0.0341	0.0373	0.91
	16	0.0305	0.0317	0.96
	17	0.0645	0.0365	1.77 *
	18	0.0835	0.0397	2.10 **
SES		-0.0083	0.0082	-1.01
SOCIAL (si)		-0.0083	0.0308	-0.27
ISTEC		0.0150	0.0273	0.55
QSCHOOL		0.0269	0.0282	0.95
SELF-ESTEEM		0.0032	0.0047	0.68
CURIOSITY		0.0254	0.0090	2.81 ***
RELATIONSHIP WITH OTHERS		0.0216	0.0078	2.77 ***
SCRUPULUOSNESS		0.0196	0.0070	2.82 ***
HUMOR		-0.0023	0.0050	-0.46
CONFIDENCE		0.0117	0.0063	1.85 *
FRIENDSHIP		0.0122	0.0101	1.21
ROLEMODEL/Eco				
	2	-0.0249	0.0138	-1.81 *
	3	-0.0100	0.0352	-0.28
	4	0.0316	0.0350	0.90
QUALAIR		-0.0001	0.0004	-0.32
ROLEMODEL/Green				
	2	-0.0435	0.0158	-2.76 ***
	3	-0.0066	0.0248	-0.27
	4	-0.0270	0.0597	-0.45

[\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.10$ ]