Alfirević, Nikša; Bilić, Ivana; Mateljak, Željko

Conference Paper — Published Version

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Suggested Citation: Alfirević, Nikša; Bilić, Ivana; Mateljak, Željko (2025) : Sacrifice Readiness for Climate Change: Evidence from Economics and Business Students in Southeast Europe, In: Gadžo, Amra Klapić, Hidajet (Ed.): Regenerative and Digital Economy: Southeastern Europe's Path to Sustainable Competitiveness, University of Tuzla Faculty of Economics, Tuzl, pp. 306-317, http://icei.ba/zbornik-radova/

Nikša Alfirević, PhD
Faculty of Economics, Business and Tourism, University of Split, Croatia
E-mail: nalf@efst.hr

Ivana Bilić, PhD
Faculty of Economics, Business and Tourism, University of Split, Croatia
E-mail: ivana.bilic@efst.hr

Željko Mateljak, PhD
Faculty of Economics, Business and Tourism, University of Split, Croatia
E-mail: zeljko.mateljak@efst.hr

SACRIFICE READINESS FOR CLIMATE CHANGE: EVIDENCE FROM ECONOMICS AND BUSINESS STUDENTS IN SOUTH EAST EUROPE

ABSTRACT

This paper examines the characteristics of economics and business students, aiming to predict their willingness to make lifestyle sacrifices to promote environmental sustainability and mitigate climate change. We use the survey data from 416 business students from five countries in the region of South East Europe (SEE). Results of statistical analysis show that gender (female) and the level of studies (higher study levels) can be associated with stronger expectations of lifestyle sacrifices, with the marginal role of self-reported belonging to the social class. We did not find any specific country differences within the SEE region. Our results provide a starting point for future empirical research on accepting pro-environmental change in higher education and suggest that behavioral trade-offs can be associated with gender effects and exposure to higher education curriculum.

Keywords: *climate change; lifestyle sacrifices; economics and business students; South East Europe (SEE).*
JEL: Q54, D91, I23

1. INTRODUCTION

Contemporary consumers are increasingly forced to change their habits, accept higher consts and inconveniences, due to different circumstances, such as rising inflation, unstable geopolitical environment, disruptions in the supply chains, etc. (Diaz et al., 2024; Badran et al., 2025); One of the less analyzed factors concerns the climate change-related sacrifices of their living standards or habits, consumers might be willing to accept, as to contribute to the protection of the natural environment (ISSP Research Group, 2020). Framing pro-environmental actions through the view of consumer sacrifice (in relation to the expected social standards) provides an alternative to the established empirical studies of consumers' pro-environmental intentions and behavior.

Our approach is empirically supported by several extant studies, which include framing of conversion from attitudes to behavior through the sacrifice lens (Diekmann & Preisendörfer, 2003), while personal sacrifice in expectations of living standards and behavioral patterns has been validated by Davis et al. (2011).

The sample for this empirical study consists of economics and business students, who will not only act as future consumers but also organizational and policy decision-makers, who will have leadership roles in shaping organizational responses to climate risks (Alfirević et al., 2024; Alfirević et al., 2025).

This paper is among the first empirical studies examining the pro-environmental consumer and higher education issues from the sacrifice lens in the SEE region. We examine which student characteristics relate to perceived sacrifices due to climate change, concerning their expected standard of living and lifestyle. Building on extant international evidence that women report higher environmental concern (Zelezny et al., 2000; Xiao & McCright, 2015) and that education relates to greater environmental concern (Franzen & Vogl, 2013), we test whether gender and higher education study levels are associated with sacrifice readiness, adjusted statistically for country and relevant socio-economic experiences.

2. THEORETICAL BACKGROUND

Public-opinion research has long argued that analyses of environmental attitudes should look beyond abstract concerns when addressing societal challenges, such as climate change. A practical viewpoint is especially relevant for empirical studies, examining what people are prepared to give up in terms of their expected lifestyles and consumption limitations, in order to promote the declared pro-environmental values. Namely, attitudes matter less when perceived costs for personal lifestyle and convenience appear (Stern, 2000); however, depending on personal and demographic characteristics (Franzen & Vogl, 2013), as well as on perceived social fairness (Mestre-Andrés et al., 2019).

The International Social Survey Program (ISSP) has conducted international empirical research on consumers' willingness to pay higher prices and/or higher taxes, and accept reduced living standards to protect the environment (ISSP Research Group, 2020). From a theoretical viewpoint, such an empirical approach, using the concept of sacrifice readiness, is supported by the values-beliefs-norms (VBN) theory, which presumes that values precede beliefs and together shape human behavior (Stern, 2000). In this context, general pro-environmental values influence actual behavior, but only when they are translated into specific beliefs about making sacrifices in expected lifestyles and consumer convenience to protect the natural environment.

Therefore, we modified the ISSP's survey approach (ISSP Research Group, 2020) and formulated a single item to assess students' readiness to make personal sacrifices to prevent climate change, considering their expected standard of living and overall lifestyle during their lifetime. Franzen and Vogl (2013) analyze ISSP data from 33 countries and show that environmental concern generally rises with economic development. They also find that personal sacrifice tracks overall concern but still adds distinct information, responding to both individual factors and national context (e.g., GDP, institutional trust).

The extant literature has extensively analyzed individual (i.e., personal and demographic) factors. Gender matters, with women scoring consistently higher on environmental concern and related orientations in different empirical studies (Xiao & McCright, 2015; Zelezny et al., 2000). Potential explanations of the effect might include gendered socialization, or other relevant effects, which are visible both in attitudes, as well as in consumption and lifestyle patterns. Namely, studies of household carbon footprints show that, on average and controlling for compositional factors, Spanish households with a larger share of male members have higher carbon footprints and intensity, especially concerning choices in transport and food consumption (Osorio et al., 2024). In addition, the consumption choices in transport and nutrition are empirically documented as relevant in different national contexts (Berland & Leroutier, 2025), pointing to the generalizability of gender effects in climate-related consumer choices.

Education also reliably correlates with environmental concerns and willingness to accept climate-related sacrifices in consumption. In different empirical samples, education has been positively associated with general pro-environmental concerns and the readiness for consumption sacrifices, in order to preserve the natural environment (Franzen and Vogl, 2013). Explanations for this effect could include access to relevant scientific information, civic awareness, and social norms supporting collectivism and collective action (e.g., Scandinavian acceptance of high taxation rates, in order to foster the provision of public goods). Studies of policy acceptance similarly report that more educated respondents tend to accept higher prices, if they are associated with natural preservation and perceived as fairly socially distributed (Franzen & Vogl, 2013; Fairbrother, 2016; Maestre-Andrés et al., 2019).

The extant higher education literature tries to evaluate the effects of sustainability content and teaching approaches, although integration of the topic and different academic teaching and learning approaches seems to be uneven (Aktas et al., 2015; Thürer et al., 2018). There is ample empirical evidence of improvement in sustainability knowledge and engagement when novel teaching and learning methods are applied. They are related to experiential learning, and include different approaches, such as community and service-learning, project-based learning, or "serious games "and simulations (Lozano et al, 2015; Molderez & Fonseca, 2018; Mabalay, 2025). Outcomes of educational interventions might lead to sustained lower self-reported carbon emissions, especially in transport and dietary choices (Cordero et al., 2020). Graduate and postgraduate study cycles of higher education might be more appropriate for the application of experiential learning, since students have already mastered the fundamental concepts. However, engagement of first-cycle students also matters, as

structured exposure to sustainability content and innovative teaching methods seems to be the key to successful introduction of sustainability to higher education (Aktas et al., 2015; Cordero, Centeno, and Todd, 2020; Thürer et al., 2018). Due to the presented arguments, we include the level of study as a relevant predictor of students' sacrifice readiness.

Willingness to accept higher costs and prices for socially and environmentally beneficial policies is also shaped by the perceptions of social trust and fairness. International empirical research indicates that social trust increases support for environmental taxation, including higher taxes, when respondents perceive the efficient use of tax funds for environmental objectives (Fairbrother, 2016; Fairbrother, 2019). The levels of perceived fairness also influence the acceptance of carbon pricing (Maestre-Andrés et al., 2019), leading to conclusions about potential country effects. Such differences could be expected only if the institutional frameworks and social norms result in variations related to the perceptions of trust and fairness. Since the SEE countries seem to be fairly aligned regarding these social indicators (Radević et al., 2022), we do not expect any significant effects across the countries in the SEE region. The extant research supports our expectations regarding country effects, as Fairbrother (2016) shows that trust relationships to pay environmental taxes are consistent and primarily undermined by social distrust (Fairbrother, 2019). These findings could be valuable for higher education in the SEE region, which has low levels of social trust and readiness for collective action (Pavičić et al., 2017; Radević et al., 2022).

Policy research shows that concerns about who bears the cost of climate policy also matter. People worry carbon pricing is unfair or regressive, and that these distributional concerns reduce public support unless public policies address them (Carattini, 2018; Maestre-Andrés et al., 2019). When governments explicitly protect lower-income groups from carbon taxes, acceptance of carbon pricing tends to rise. Although our student sample has a narrow income spread, this literature helps explain why we decided to include the perceived social class into the analysis.

Finally, the climate-policy literature helps explain why students' indicators of civic experience (related to volunteering, civic activism, and donations to civic organizations) might not show as significant, once we control for the gender effect and the policy framing of who should bear the climate change costs (Drews & van den Bergh, 2016). Still, we include the civic background indicators in our analytic strategy to seek alternative robust explanations for the empirical trends.

3. METHODS

3.1. Design and sample

We analyzed a cross-sectional survey of economics and business students from five countries in the Southeast European region. Recruitment was conducted through announcements at the internal Moodle Learning Management System for large compulsory courses at participating HEIs. Participation was voluntary, and participants were anonymous. We used listwise deletion for multivariate models, so sample sizes differ across statistical analyses, mirroring our approach used in prior studies in the field (Alfirević, Rendulić, and Mlaker Kač, 2025; Alfirević, Klepić, and Mihaljević Kosor, 2025).

3.2. Measures

We measured sacrifice readiness with a single survey item and converted the responses to z-scores, thereby standardizing the dependent variable across the sample. Our main predictors were gender (1 = male, 2 = female) and study level, recorded according to Bologna cycles and also transformed into a z-score to capture a linear progression across cycles. Due to the previously discussed theoretical arguments, we also use z-standardized age and perceived social class as additional covariates. To capture the country context, we used five dummy variables to represent each of the SEE participating countries (Slovenia, Croatia, Bosnia and Herzegovina, Serbia, and Montenegro).

We also added a set of binary background indicators to capture students' experiential profiles: prior social or political activism, volunteering, donating, general work experience, management experience, and entrepreneurial experience. These simple indicators enable us to check whether a civic (activism) background or professional exposure to managerial and entrepreneurial experience explains variation in readiness. To

provide a narrative description of our results, we created a three-category staging variable from the original item: Low (1.00–2.99), Mid (3.00–3.99), and High (4.00–5.00). The grouped variable is used only in the crosstabulations and chi-square tests described below.

3.3. Analytic strategy

We estimated a general linear model (GLM) in SPSS 28 software package with the z-standardized sacrifice-readiness score as the dependent variable. Gender, country, and the set of binary background indicators were entered as fixed factors, while age, perceived social class, and study level (all z-score standardized) were entered as covariates. The potential national influence was modeled through dummy variables to obtain within-country adjusted comparisons. For inference, we report F statistics, exact p-values, and partial eta-squared effect sizes, and we present estimated marginal means for gender with Bonferroni-adjusted pairwise comparisons.

To complement the model with an easily interpretable profile, we examined the descriptive association between the three-level transformed variable and study level using crosstabulation, evaluating overall association with the Pearson chi-square test and testing for eventual statistical significance using the linear-by-linear association statistic.

4. RESULTS

We used the general linear model (GLM) to test whether gender, study level, self-reported social class, country, and civic experience predict the students' readiness for lifestyle sacrifices, in order to prevent climate change. We assumed linearity and additivity, as well as residual homoskedasticity, which was checked using the Levene test. Its results show slight heteroscedasticity across cells ($F(162, 253) = 1.27$, $p = .044$), which calls for cautious interpretation of statistical results. The omnibus test shows that the overall model is significant at 1% level ($F(15, 400) = 2.10$, $p = .009$), although its predictive power is relatively low ($R^2 = .073$, adjusted $R^2 = .038$).

Table 1. Tests of Between-Subjects Effects for Sacrifice Expectations (GLM with Country Fixed Effects)

Predictor	**df_effect**	**df_error**	**F**	**P**	**Partial eta squared**
Gender	1	400	7.379	.007	.018
Study level (standardized)	1	400	9.507	.002	.023
Perceived social class (standardized)	1	400	3.707	.055	.009
Age (standardized)	1	400	0.186	.666	<.001
Country	5	400	0.388	.857	.005
Social Activism	1	400	1.182	.278	.003
Volunteering	1	400	3.203	.074	.008
Donating	1	400	0.298	.586	.001
Work experience	1	400	1.104	.294	.003
Management experience	1	400	0.569	.451	.001
Entrepreneurship experience	1	400	0.295	.587	.001

Note. DV is a standardized value of the item stating: "During my lifetime, I will have to make sacrifices in my everyday life because of climate change".

In GLM, tests of between-subjects effects are reported in units of standard deviation (SD) of the dependent variable (see Table 1). Results show that the standardized study level was positively associated with the sacrifice expectations ($F(1, 400) = 9.51$, $p = .002$, partial Eta squared = .023). Thus, students at higher study cycles anticipated greater lifestyle sacrifices. Perceived social class was marginally significant ($p = .055$), while standardized age proved to be insignificant ($p = .666$).

For the dummy variables, tests of between-subject effects in Table 1 report the contrast for the group, not possessing the background experience (coded as 0), versus the reference group with the background experience (coded as 1) in SD units of the dependent variable. In this group of predictors, civic activism and background (work, managerial, and entrepreneurial) experience indicators were not significant (activism, p = .278; donating, p = .586; volunteering, p = .074; work experience, p = .294; management experience, p = .451; entrepreneurship, p = .587). Although the effects of those predictors were small and inconsistent, it is interesting to note that students with civic donations and volunteering experience tend to have slightly higher sacrifice perceptions, with a marginally negative effect for students with a social activism background. There were no meaningful country-specific effects (F(5, 400) = 0.39, p = .857, partial eta squared = .005), which can be an interesting guideline for further research, showing that the business students across the SEE region can be treated as a relatively homogeneous group.

Gender had a significant effect on the predicted lifestyle sacrifices (F(1, 400) = 7.38, p = .007, partial eta squared = .018). Women perceived higher lifestyle sacrifices than men (with the estimated marginal means for women M= -0.07, SE = 0.12 and M = -0.38, SE = 0.14 for men). We also tested for the pairwise difference, using the Bonferroni adjustment (p = .007). Results show a statistically significant mean difference of -0.318 SD units (see Table 2).

Table 2. Estimated Marginal Means and Pairwise Comparison for Gender

Group	**Mean_z**	**SE**	**95% CI (lower, upper)**
Men	-0.384	0.141	[-0.661, -0.108]
Women	-0.067	0.116	[-0.294, 0.161]

Note. Pairwise comparison (Bonferroni-adjusted): Men vs Women, mean difference = -0.318 (SE = 0.117), p = .007; 95% CI [-0.547, -0.088].

In addition to the gender effect, we also examined the study-level effects to enhance robustness. We first transformed the dependent variable (sacrifice readiness) into three categories (high sacrifice level: 4-5, mid-level: 3-3.99, and low-level: 1-2.99). We conducted a crosstab analysis to obtain a descriptive profile of sacrifice readiness across the three study levels (see Table 3). The chi-square test value of 16.64 (p = .002) shows the distribution of readiness stages differs by study level. In contrast, the value of linear-by-linear association (chi-square = 5.84, p = .016) confirms a monotonic trend, with higher study cycles possessing higher readiness for lifestyle sacrifices.

Table 3. Sacrifice-Readiness Categories by Study Level and Chi-Square Test

Study level	**Low (%)**	**Mid (%)**	**High (%)**	**n**
BA (1st cycle)	19.7	38.6	41.8	249
MA (2nd cycle)	12.9	25.0	62.1	140
Postgrad/PhD (3rd cycle)	21.4	23.8	54.8	42
Total	17.6	32.7	49.7	431

Note. Pearson chi-square (4, N = 431) = 16.64, p = .002; linear-by-linear association = 5.84, p = .016. Percentages represent row percentages at the study level.

5. DISCUSSION

Two consistent empirical findings can be identified from the results, described in the previous section: women reported higher readiness than men, and higher study cycles reported higher readiness than lower cycles. Perceived social class had a marginal positive association, while country differences were negligible after controls. Civic background experience indicators proved to be insignificant predictors.

The gender gap is aligned with the empirical evidence of women's higher environmental concern (Zelezny et al., 2000; Xiao & McCright, 2015), as well as gendered consumption profiles, which lead to higher carbon emissions (Carlsson Kanyama et al., 2021; Osorio et al., 2024). Our results concerning the higher willingness of (post)graduate students to bear the environmental costs are consistent with the extant research, linking education to higher environmental concern and willingness to pay (Franzen & Vogl, 2013) and with the idea that business-school curricula and academic maturity can support readiness to accept trade-offs (Aktas et al., 2015; Beamond et al., 2024).

There are several practical implications of our empirical research for business schools and their partners. Firstly, as readiness to accept climate-related sacrifices improves among economics and business students as they progress to higher study cycles, the introduction of sustainability content should begin at the first cycle, with a focus on graduate study levels. At this point in their higher education, students are also more prepared for experiential learning, such as carbon-budgeting projects, decarbonization tasks, and case studies.

Second, the gender difference points to the need for audience-aware teaching. Men in our sample reported lower readiness on average, so instructors should vary examples and activities to show how costs and benefits are distributed across different lifestyles and roles. Small changes can reframe consumer sacrifices as professional and collective choices, not only moral ones.
Since country effects are weak, regional co-operation proves to be essential for effective academic teaching and learning about climate change. The same teaching materials and approaches can be used across institutions of higher business education in the region, with some minor translation(s) and language editing, without loss of relevance. This finding can contribute to significantly lower costs of sustainability teaching in the regional business school.

We also found that the civic and professional background does not predict sacrifice readiness, once other predictors were included. Practically, this suggests that curriculum design is more significant than trying to reach specific student target groups, which certain types of educational interventions could potentially reach. Since volunteering proved to be a marginally positive, but still statistically insignificant, predictor, the business schools might consider the value of structured service-learning or community projects in their specific environment.

Finally, sacrifice readiness itself can be a valuable, easy-to-communicate metric for program evaluation. It complements knowledge and attitude measures and can be tracked across student cohorts.

This study has multiple limitations. Our study design is cross-sectional, so observed associations are not causal. A higher study level may co-vary with unobserved factors that also influence readiness to make climate-related sacrifices in consumption and lifestyle. The sample comprises business and economics students from a set of cooperating business schools in a single region. Due to non-probability sampling, the results are not representative of all students or countries in the region. We did not model program-level or institution-level features (e.g., mandatory sustainability courses, pedagogical approach, accreditation), so there could be variations across business schools, depending on their involvement and interventions used in the field of introducing sustainability teaching. Finally, we did not include measures of social desirability or impression management that could inflate self-reports, nor did we test measurement invariance across countries for the staging thresholds.

Future research tasks should address the limitations of the current, initial study, which argues that the climate sacrifice is a relevant starting point, to be considered both in the sustainability teaching and interventions in higher education in business and economics. Therefore, researchers might wish to consider the sacrifice readiness concept further and develop a brief scale for its measurement, extending our simple empirical strategy, based on a single item. Sacrifice readiness should be linked to the analysis of higher education curriculum, evaluated based on the intensity of sustainability content and innovation of teaching and learning approaches. Empirical results should track change over time by using cohort or panel designs, and integrate qualitative insight, with short interviews with students and business school faculty. Researchers should also consider using the professional intention as a relevant predictor, along with other indicators of lifestyle trade-offs, including carbon pricing for different consumer items.

6. CONCLUSION

We have conducted initial research on the readiness of economics and business students in the SEE region to accept lifestyle trade-offs due to climate change. Using a GLM approach with fixed country effects, we found small but consistent associations: women reported higher readiness than men, and students in higher study cycles reported higher readiness than those in earlier cycles of higher education. Perceived social class showed a marginal positive association, while country differences were negligible once other predictors were included. These results align with the extant literature, which links educational efforts to the development of environmental concerns and acceptance of carbon-based pricing (Franzen & Vogl, 2013; ISSP Research Group, 2020). We have identified multiple practical implications for regional business schools and recommendations for future research, as the initial results demonstrate that sacrifice readiness could be an interesting starting point for framing educational interventions.

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