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How Green are Economists?

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Summary

The market for voluntary carbon offsets has grown steadily in the last decade, yet it remains a very small niche. Most emissions from business travel are still not offset. This paper exploits a unique dataset examining the decision to purchase carbon offsets at two academic conferences in environmental and ecological economics. We find that having the conference expenses covered by one's institution increases the likelihood of offsetting, but practical and ethical reservations as well as personal characteristics and preferences also play an important role. We draw lessons from the effect of objections on the use of offsets and discuss the implications for practitioners and policy-makers. Based on our findings, we conclude that ecological and environmental economists should be more involved in the design and use of carbon offsets.

Keywords: Voluntary Carbon Offsetting, Public Goods, Ecological Economics, Environmental Economics

JEL Classification: D6, H8, Q4

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Abstract

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1 Introduction

While international negotiators have struggled to find an effective agreement limiting global greenhouse gas emissions for two decades, an important contribution to climate change mitigation has come from unilateral initiatives from countries, regions, cities and private citizens. Such trend supports Ostrom's vision of the rise of a polycentric governance, and more in general the non-negligible scope for cooperation in the climate commons (Ostrom 2009; Tavoni and Levin 2014; Carattini et al. 2015). A notable example of voluntary provision of climate change mitigation is represented by the market for voluntary carbon

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offsets. This market has grown exponentially in the last decade: in their analysis, Conte and Kotchen (2011) reported the existence of 97 offset providers and 280 offset projects. According to the same source, we now count 142 registered providers for an overall number of 579 projects worldwide[1].

From a theoretical perspective, individuals may voluntarily contribute to a public good because they derive some utility from the public good being provided (pure altruism) or from their own contribution, due for instance to *warm glow* (Andreoni 1990) or positive self-image (Nyborg et al. 2006). A further and very contextual explanation relies on the idea of compensating other activities that reduce the overall level of the same public good (Kotchen 2009). Hence, instead of restraining one's carbon footprint, one may "pay someone else to reduce emissions and achieve the same effect on atmospheric concentrations" (Conte and Kotchen 2010, p. 93). Assuming that one cares about one's own carbon footprint, from a standard economic perspective it is efficient to purchase carbon offsets as long as their cost is lower than one's own marginal abatement cost.

Carbon offsets are purchased by individuals, companies and organizations concerned with their environmental footprint or the image that such footprint conveys. Academic activities such as travel to conferences are receveing increasing attention due to their sizeable carbon footprint (Spinellis and Louridas 2013; Desiere 2016), and many academic institutions have started using carbon offsets. In 2015, the conferences of both the European Association of Environmental and Resource Economists (EAERE, held in Helsinki, June 24-27 2015) and the European Society for Ecological Economics (ESEE, held in Leeds, June 30-July 3 2015) offered registering participants the possibility to purchase carbon offsets to compensate for the emissions associated with their participation. We exploit this opportunity to provide novel evidence on the economics of carbon offsets.

A growing literature, including the one pertaining to the demand for climate change mitigation, has focused on the main determinants of the demand for offsets, generally relying on stated preferences (see Nemet and Johnson 2010 for a review). We rely both on official conference data about observed offsetting behavior and on a survey which we asked participants of both conferences to take.. The survey request was sent after the offset decision was made by participants, and it provides useful complementary information that allows us to assess the rationale behind the offsetting decision. This strategy is used to decrease the likelihood of dishonest (socially desirable) answers. It also allows us to compare the answers in our sample to the general behavior of the conference participants.

The behavior of experts, as observed in the field, may differ dramatically from the behavior of lay people (Harrison and List 2004). Previous research has shown that environmental economists' decision to offset does not depend on the default option given in the registration process, whereas the default option is generally found to have a positive uptake effect on lay people (Löfgren et al. 2012). The refutation of this stylized fact among experts suggests that they tend to have a set opinion on carbon offsets. Furthermore, the general public

[1] Source: http://www.carboncatalog.org/. Visited October 23, 2015.

has expressed skepticism due to both ethical and practical concerns about the use of carbon offsets (cf. Conte and Kotchen 2010). We thus shed light on whether these objections are also shared by experts.

We find that having the conference expenses and offsets covered by the institutions clearly increases the likelihood of offset adoption. However, funding is a partial explanation. Even in this specific case of potential moral hazard, we find that a sufficiently high level of satisfaction with the proposed offsetting program is necessary to induce economists with practical reservations to participate in offsetting activities. We also find that some individual-specific characteristics have a surprising impact on the likelihood to offset. Based on these results, we derive several implications for both practitioners and policy-makers.

2 Methodology

In 2015 EAERE allowed those that registered to the annual conference to purchase a 10 euros offset certificate to compensate European flights and a 40 euros offset for intercontinental flights. The revenue was used to prevent eutrophication in the Baltic Sea. At the same time, ESEE offered the possibility to withdraw one ton of CO_2 from the European Union Emission Trading System[2]. With the support of the local organizers we contacted all participants from the two conferences and invited them to participate in the same anonymous online questionnaire.

We obtained data on the offset decision and a series of participant's personal and academic characteristics. The main descriptive statistics are displayed in Table A.1 and A.2. We collected 176 (66) observations for the ESEE (EAERE) conference, for a total of 242 responses. Based on ESEE data, we know that 495 researchers registered at the conference, of which 195 students. The implied response rate is of about 35%, higher than in most online surveys. There are about 45% of students in our sample, approximately the same as the observed rate. Participation to the offset program is around 46% in our ESEE sample, quite close to the actual participation (around 50% according to the organizers). The response rate for EAERE is instead about 10%, and participation to the offset program is around 37% (the official participation rate isapproximately 20%). Based on these statistics, we can arguably provide better external validity for the ESEE conference, relative to the one organized by EAERE[3].

We also have information on whether the institution covers the conference-related expenses, and the offsets for those that purchased them[4]. This is the

[2] The details of the offsets programs were also provided to conference participants through the conference websites and booklets. While they differ in their characteristics, both options correspond to the definition of carbon offsets. We discuss below the implications of the two different programs for our analysis.

[3] In all estimations we introduce a dummy variable controlling for the conference that the respondent attended. In this way we are able to capture the difference between the two samples. Given the relatively low number of observations available for the EAERE conference, we take a conservative stance and refrain from providing estimations for small subsamples.

[4] Since the two variables are 74% correlated, and the latter would always predict success

case for the vast majority of respondents (73%). This is an unexplored situation for the young literature on carbon offsets and comes with potentially large implications not only for academics but possibly also for business travelers at large[5]. Since most individuals in our sample have the possibility to fully pass over the costs of offsets, it is particularly interesting to understand why some of them refrain from offsetting.

We also know how the participants reached the conference and whether they had any reservations concerning the use of offsets. That is, participants are requested to express any concerns they may have concerning offsetting in general, regardless of the option proposed by the respective conference. About 20% (15%) of the sample expressed ethical (practical) reservations. Those who did were prompted to answer an additional open question, to elicit their perplexities (see the most emblematic answers in Table A.1). Most comments concerning practical issues cast doubts on the effective abatements realized by offsetting programs in general, raising issues of additionality and credibility, in particular for afforestation projects and absent any tight oversight (see Schneider and Kollmuss 2015). This may create an additional difference between economists and lay people, the latter being especially favorable to forest offsets (Blasch and Farsi 2014). Part of the ethical critique challenges the monetarization of pollution, while the remaining part challenges the practice of keeping emitting while (sometimes) offsetting, calling into question the moral implication of encouraging offsets and justifying carbon-intensive lifestyles (see Anderson 2012 for a detailed critique). Finally, respondents are asked to rate the specific offsetting program chosen by the conference organizers.

3 Results

Estimates are provided in Tables 1 and 2. Given the binary nature of this decision, we use Probit regressions[6]. In Table 1 we test our main specifications. We bundle all participants having reached the conference by plane and compare them with relatively cleaner transport modes. We also control for whether the conference expenses are covered by the participant's institution and introduce a dummy for the conference to which the data refer. This dummy could measure either the difference in the audience or in the offset programs (we control to a large extent for location by transport modes). The two offsetting programs are indeed relatively different in their typology, each conference organizer possibly

in the econometric model, we only introduce the former in the analysis.

[5] The civil aviation industry is said to be responsible for about 2% of global and about 10% of transport greenhouse gas emissions (IPCC 2014). A non-negligible part of these emissions is due to business travelers, who are known to be particularly inelastic to price variation (Borenstein and Rose 2007; Puller and Taylor 2012).

[6] The EAERE conference distinguishes offsetting between continental and intercontinental flights. The latter was chosen by 2% of the conference participants. Given the number of observations at our disposal, we keep offsetting as a binary outcome. Our results would not change if controlling for flying an intercontinental flight. The empirical results are qualitatively and in most cases quantitatively unchanged if a Logit specification or marginal effects at mean are used instead of average marginal effects. All variables are in levels.

facing a different set of preferences for offsetting projects (see below). Hence, to disentangle the two effects and capture differences in audience, we include the total number of EAERE and ESEE conferences attended by all participants, regardless of their current choice. This strategy allows us to capture differences in the identification of researchers to either or both societies, taking also into account potential differences in preferences for attending conferences. In turn, differences in belonging may be also driven by different backgrounds, for which we are however unable to control. The environment around ecological economics is indeed known to be particularly multidisciplinary, whereas environmental economists are usually trained as economists. We hence use the term "green economists" to denote social scientists dealing with environmental matters in close relation to ecological or environmental economics, knowing that they may not all define themselves as economists. We provide further analysis below trying to identify different perspectives among those we define green economists, in particular with respect to the appropriate approach to growth to be taken while dealing with climate change. We also include information on the academic rank of the interviewee, to proxy for income differences. Since salary may also depend on the level of seniority and the country of affiliation, column (2) controls for the country of affiliation for a number of countries for which we have multiple observations. With these variables we also expect to capture differences in the budget of the institution, which could affect the decision to save on conference expenses. In column (3) we introduce attitudes towards offsets.

First of all, we observe that the ability to pass over the full cost of the conference to the employer is associated to a higher probability to offset. While the positive and relatively large coefficient suggests that it is easier for economists to be green with their institution's money, the implied probability is still far from one. Hence, other reasons have to be explored to explain why economists may not offset even when this is likey to come at no private cost. Surprisingly, the probability of offsetting decreases almost linearly as we move from students to full professors. One explanation might be that tenured participants are less likely to do their booking themselves and incentives may then be better aligned with their departments'. An alternative explanation is that established academics - especially in economics - may be particularly cynical, for either selection or training reasons (see Fourcade et al. 2015). The negative and significant coefficient for some countries such as Spain and Germany relative to the rest of the world suggests that there are differences in income as well as in the tightness of the budget constraint, even when controlling for whether the institution covers the expenses. Even if offsets could be passed over, overspending at one conference may have implications for the opportunity to attend other events, or use departemental funds for other research purposes. Given the positive sign of the age variable, most of the effect it captures is probably related to differences in seniority rather than different generational perspectives[7].

The estimates from column (3) indicate a positive and significant effect re-

[7] We use six of the seven U.S. Census age categories (see Table A.1 for more details). The coefficient for age remains positive and significant if using mid-points for each category.

Table 1: Decision to offset - Main estimates from Probit

	(1)		(2)		(3)	
	Marginal effects	S.E.	Marginal effects	S.E.	Marginal effects	S.E.
Reaching the conference by plane	0.061	(0.077)	0.101	(0.093)	0.103	(0.088)
Institution covering expenses	0.130*	(0.076)	0.163**	(0.073)	0.166**	(0.070)
ESEE survey	0.139	(0.104)	0.168*	(0.099)	0.151	(0.098)
Characteristics of the participant						
ESEE conferences attended	0.014	(0.023)	0.019	(0.022)	0.022	(0.022)
EAERE conferences attended	0.029	(0.025)	0.032	(0.024)	0.027	(0.024)
Female	-0.051	(0.069)	-0.067	(0.068)	-0.060	(0.067)
Age	0.124**	(0.054)	0.133**	(0.052)	0.134**	(0.052)
Student	0.603***	(0.072)	0.621***	(0.048)	0.610**	(0.062)
PhD student	0.235	(0.229)	0.300	(0.198)	0.255	(0.209)
Postdoctoral researcher	0.183	(0.263)	0.239	(0.251)	0.171	(0.255)
Senior researcher	0.010	(0.301)	0.072	(0.304)	0.007	(0.287)
Assistant professor	0.040	(0.303)	0.067	(0.299)	0.008	(0.283)
Associate professor	0.072	(0.320)	0.064	(0.312)	-0.008	(0.291)
Full professor	-0.118	(0.259)	-0.091	(0.269)	-0.142	(0.238)
Austria			-0.046	(0.145)	-0.031	(0.144)
Belgium			-0.149	(0.131)	-0.134*	(0.126)
Germany			-0.229***	(0.076)	-0.218***	(0.076)
Spain			-0.219**	(0.099)	-0.224**	(0.090)
Switzerland			0.035	(0.151)	0.088	(0.148)
UK			0.028	(0.109)	0.011	(0.103)
Opinion on offsets						
Contrasting behavioral changes					0.089	(0.096)
Pricing the unpriceable					-0.151	(0.187)
Doubts on the effective realization					0.279***	(0.096)
Pseudo R^2	0.072		0.114		0.49	
Log pseudolikelihood	-124.47		-118.96		-114.24	
N	201		201		201	

Average marginal effects. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Some participants declare to have already offset through alternative programs.

With our set of controls this variable predicts failure perfectly and is thus not included among the covariates. Clerk is the reference category for the academic position.

Table 2: Decision to offset - Additional estimates from Probit (restricted sample)

	(1)	(2)
	Marginal effects (S.E.)	Marginal effects (S.E.)
Reaching the conference by plane	0.041	0.015
	(0.097)	(0.102)
Institution covering expenses	0.087	0.087
	(0.076)	(0.082)
ESEE	0.113	-0.009
	(0.104)	(0.122)
Satisfaction with green offsets	0.062***	0.066***
	(0.017)	(0.017)
Degrowth as appropriate approach to climate change		0.159*
		(0.097)
Characteristics of the participant	Yes	Yes
Opinion on offsets	Yes	Yes
Pseudo R^2	0.259	0.282
Log pseudolikelihood	-83.00	-71.34
N	167	147

Average marginal effects. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

lated to expressing concerns on the practical implementation of offsets. Hence, expressing pragmatic concerns over offsetting in general does not necessarily imply not purchasing the offsets proposed by the conference organizers. This fact is of particular interest. Our interpretation is that ecological and environmental economists are indeed experienced consumers as suggested by Löfgren et al. (2012), and not only are unaffected by the default choices but are also particularly attentive to the properties of the offsetting program that they are asked to purchase. Despite the general practical concerns that these economists express, part of them were convinced by the organizers' proposal and trusted their offsetting choice. We believe that this result comes with particular implications. As for any good (and policy), its design and characteristics matter for attentive consumers. Conference participants may be requested to trade-off the warm glow or self-image benefit from offsetting with guilt from charging institutes a higher bill. This result also suggests that conference organizers did a relatively good job in addressing the potential critiques from their attendees, critiques which could differ between conferences (see below), and proposed an offsetting option that could convince at least those having practical concerns over offsetting in general terms.

This finding is supported by the results of Table 2, where we restrict attention to the 183 respondents who rated the proposed offset program. Controlling for the same covariates as in column (3) of Table 1, our estimates from column (1) point to a positive and significant effect of appreciating the specific program. The coefficient implies that any marginal improvement on the 7-point scale comes with a 6% higher likelihood of offsetting. Note that the distribution of concerns about the offsetting program is different between conferences, with ethical implications being primarily a concern for ecological economists. That is, while we do not find a significant difference in the frequency of offsetting between the two populations, the reasons for offsetting may substantially differ. To further differentiate between the attendees at the two conferences we control in column (2) for what respondents consider the most appropriate approach to growth while tackling climate change. 75% (20%) of the EAERE (ESEE) sample support green growth whereas 11% (68%) declare to be rather favorable to degrowth, pointing to persistent differences in the characteristics of economists attending one or the other conference, in spite of the convergence in the main research outlets (cf. Plumecocq 2014). We observe that the coefficient for the ESEE conference becomes practically zero, suggesting that this decoupling in preferences for (de)growth probably contributes to differentiate between "real" ecological and environmental economists. Compared to green growth, being in favor of degrowth is associated to a higher propensity to offset.

The empirical analysis of offsetting decisions we have performed here allows us to study the behavior of experts and derive some lessons for both practitioners and policy-makers. First, we find that the ability of passing over the conference costs to one's employer increases the likelihood of participating in the offset market. While this finding may seem obvious, it has important implications. Emissions from traveling, in particular from aviation, represent a non-negligible portion of global greenhouse gases and their regulation under the

umbrella of an international agreement is still part of a fierce debate. Managing to make offsetting the norm when traveling for business would provide a large push forward for voluntary carbon markets, implying also higher prices and stronger signals for all actors in the market. Second, we provide empirical evidence that practical concerns with the mechanics of offsets may coexist with their uptake. This somewhat unexpected result has far-reaching implications. Skepticism based on practical issues is founded on recent negative experience with carbon markets, and is likely to be persistent. Whether such experiences will hinder the development of voluntary offsets and carbon markets is an open question. Our preliminary answer, based on experts' behavior, is that such skepticism should be an additional motivation for offsets program managers to offer sound projects that reassure potential buyers. Our evidence suggests that both academic societies were quite successful in this task. Project providers should learn from this experience. The same applies to policy-makers, who now face the hard task of rebuilding confidence in integrated carbon markets and deliver "internationally transferable mitigation outcomes" (article 6 of the Paris Agreement). Failing to do so could imply very high mitigation costs, and could possibly jeopardize the current pledges and the ambition of more stringent post-2020 targets (Baranzini et al. 2015). Whether the opinion of the public is as reactive to the properties of different offsetting designs is beyond the scope of this paper. However, our results suggest that the experts' ability to distinguish sound offsetting projects from unrealiable ones could and probably should be put at the service of society, to both orient policy decisions and increase confidence in sound offsetting. In this sense, further research on the reservations of the general public, and how these may be affected by expert opinion, would be useful to shed light on the potential for the profession to increase the market for voluntary carbon offsets in size and quality, as well as to contribute to the acceptability of future international carbon markets.

Finally, this study provides new information about conference participants in ecological and environmental economics, with useful implications for all economists active in the field. While one may argue that the separating line between environmental and ecological economics is increasingly blurred (Plumecocq (2014)), such difference persists among those that attend the respective conferences, perhaps due to a greater proclivity for interdisciplinary work in economics in recent years (Tavoni and Levin (2014)). Hence, looking only at convergence in journals, one may miss part of the story of the evolution of ecological and environmental economics as schools of thought organized in different and possibly competing societies. Based on our results, we speculate that to appreciate the differences that set the two apart, one should attend both conferences, since the conceptual differences between ecological and environmental economics are more nuanced in the publications of the respective flagship journals.

4 Conclusions

In the last decade the market for offsets has grown rapidly, but still remains a niche market. Most professional activities are still not offset, even though in many situations businessmen could seemingly pass over the cost of offsets to their employer. We investigate this issue by analyzing the behavior of ecological and environmental economists who are likely to be familiar with such instrument. We find that having the option to pass over the cost is associated with a larger likelihood of offsetting. However, economists can be refractory to purchase offsets for a number of reasons, which may also differ between ecological and environmental economists. Ethical concerns mainly challenge the pollute and offset paradigm, which tends to lend legitimacy to more business as usual and possibly delay the required regime shift towards a society living within planetary boundaries. Practical concerns are related with the effective realization of offsets, including issues of additionality and credibility.

We believe that all these concerns expressed by experts should be given an appropriate space in the societal debate and should be taken into account by policymakers, who in the next years are likely to increasingly rely on carbon credits to meet their pledges. Likewise, project providers have much to learn from an open dialogue with the end-users, with a view to facilitating future growth in this market. While the profession has expressed many concerns towards carbon offsets, our results show that both ecological and environmental economists are willing to participate in the voluntary carbon markets, provided that offset projects meet certain criteria. Scaling up voluntary carbon markets and the public purchase of foreign offsets may thus benefit from the profession's endorsement, which of course needs to be earned with proper design and transparent proposals.

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References

Kevin Anderson. The inconvenient truth of carbon offsets. *Nature News*, 484 (7392):7, 2012.

James Andreoni. Impure altruism and donations to public goods: A theory of warm-glow giving? *Economic Journal*, 100(401):464–77, 1990.

Andrea Baranzini, Jeroen van den Bergh, Stefano Carattini, Richard Howarth, Emilio Padilla, and Jordi Roca. Seven reasons to use carbon pricing in climate policy. Working Paper wpdea1507, Department of Applied Economics at Universitat Autonoma of Barcelona, 2015.

Julia Blasch and Mehdi Farsi. Context effects and heterogeneity in voluntary carbon offsetting – a choice experiment in Switzerland. *Journal of Environmental Economics and Policy*, 3(1):1–24, 2014.

Severin Borenstein and Nancy L. Rose. How airline markets work...Or do they? Regulatory reform in the airline industry. NBER Working Paper 13452, National Bureau of Economic Research, Inc, 2007.

Stefano Carattini, Andrea Baranzini, and Jordi Roca. Unconventional determinants of greenhouse gas emissions: The role of trust. *Environmental Policy and Governance*, 25(4):243–257, 2015.

Marc N. Conte and Matthew J. Kotchen. Explaining the price of voluntary carbon offsets. *Climate Change Economics*, 01(02):93–111, 2010.

Sam Desiere. The carbon footprint of academic conferences: Evidence from the 14$^{\text{th}}$ EAAE Congress in Slovenia. *EuroChoices*, 15(2):56–61, 2016.

Marion Fourcade, Etienne Ollion, and Yann Algan. The superiority of economists. *Journal of Economic Perspectives*, 29(1):89–114, 2015.

Glenn W. Harrison and John A. List. Field experiments. *Journal of Economic Literature*, 42(4):1009–1055, 2004.

IPCC. Fifth Assessment Report - Mitigation of Climate Change. Technical report, 2014.

Matthew J. Kotchen. Voluntary provision of public goods for bads: A theory of environmental offsets. *Economic Journal*, 119(537):883–899, 2009.

Åsa Löfgren, Peter Martinsson, Magnus Hennlock, and Thomas Sterner. Are experienced people affected by a pre-set default option—Results from a field experiment. *Journal of Environmental Economics and Management*, 63(1): 66–72, 2012.

Gregory F. Nemet and Evan Johnson. Willingness to pay for climate policy: A review of estimates. SSRN Scholarly Paper ID 1626931, Social Science Research Network, 2010.

Karine Nyborg, Richard B. Howarth, and Kjell Arne Brekke. Green consumers and public policy: On socially contingent moral motivation. *Resource and Energy Economics*, 28(4):351–366, 2006.

Elinor Ostrom. A polycentric approach for coping with climate change. Policy Research Working Paper Series, The World Bank, 2009.

Gaël Plumecocq. The second generation of ecological economics: How far has the apple fallen from the tree? *Ecological Economics*, 107:457–468, 2014.

Steven L. Puller and Lisa M. Taylor. Price discrimination by day-of-week of purchase: Evidence from the U.S. airline industry. *Journal of Economic Behavior & Organization*, 84(3):801–812, 2012.

Lambert Schneider and Anja Kollmuss. Perverse effects of carbon markets on HFC-23 and SF6 abatement projects in Russia. *Nature Climate Change*, 2015.

Diomidis Spinellis and Panos Louridas. The carbon footprint of conference papers. *PLOS ONE*, 8(6), 2013.

Alessandro Tavoni and Simon Levin. Managing the climate commons at the nexus of ecology, behaviour and economics. *Nature Climate Change*, 4(12): 1057–1063, 2014.

Appendix

A.1 Tables

Table A.1: Summary statistics: socio-economic and professional characteristics

Variable	Mean	Std. Dev.	Min.	Max.	N
Socio-economic characteristics					
Gender (female)	0.495	0.501	0	1	220
Age (15-24; ... ; 55-64; >65)	3.627	0.987	2	7	220
Professional characteristics					
BA/MA student	0.033	0.179	0	1	212
PhD student	0.405	0.492	0	1	222
Post-doctoral researcher	0.194	0.396	0	1	222
Senior researcher	0.077	0.267	0	1	222
Assistant professor	0.068	0.252	0	1	222
Associate professor	0.068	0.252	0	1	222
Full professor	0.072	0.259	0	1	222
Clerk	0.131	0.338	0	1	222

Table A.2: Summary statistics: Transport modes, offset decisions and preferences

Variable	Mean	Std. Dev.	Min.	Max.	N
Offset					
Decision to offset	0.409	0.493	0	1	225
Institution covers all costs	0.73	0.445	0	1	230
Institution covers in part	0.14	0.348	0	1	242
Ethical reservations	0.202	0.403	0	1	242
Practical reservations	0.153	0.361	0	1	242
Transport modes (multiple transport modes possible)					
Walking, cycling	0.025	0.156	0	1	242
Car	0.074	0.263	0	1	242
Km driven by car	7.3	60.43	0	700	237
Coach	0.07	0.256	0	1	242
Km driven by coach	22.242	124.973	0	1300	240
Train	0.409	0.493	0	1	242
Km driven by train	209.885	460.402	0	2600	226
Flight within the country	0.025	0.156	0	1	242
Flight within Europe	0.587	0.493	0	1	242
Flight from outside Europe	0.07	0.256	0	1	242
Environmental and academic preferences					
Participation at EAERE conferences	0.913	1.723	0	9	242
Participation at ESEE conferences	1.492	1.813	0	9	242
Business as usual	0.023	0.149	0	1	220
Green growth	0.355	0.479	0	1	220
Degrowth	0.523	0.501	0	1	220
Satisfaction with offset options	5.044	1.827	0	7	183
Satisfaction with vegeterian options	5.097	1.84	0	7	155
Satisfaction with packaging	4.409	1.867	1	7	149
Satisfaction with recycling options	4.23	1.91	1	7	148

Table A.3: Emblematic examples of reservations related to offsets

Reservations	Conference
Contrasting behavioral changes necessary to deal with climate change	
"Could make people fly more if they think offsetting solves all environmental harm from flying"	EAERE
"I am not convinced that CO_2 offsets actually work but rather think that I am buying a relief for my bad conscience"	EAERE
"I think it is just a patch, we would need to modify much more our lifestyles/society/culture"	ESEE
"In the end are an excuse for inaction amongst high emitters who acknowledge the climate change problem but see themselves as too important to make the necessary and significant adjustments to their own live; so they "buy indulgences" instead"	ESEE
"In the long run, a change of habit is necessary for which those offsets might actually become an obstacle"	ESEE
"Given the urgency of climate issue, CO_2 offsets are illusive. Offsets only work if we're already at low enough emission levels (i.e. consume and produce within planetary boundaries)"	ESEE
"To induce moral licencing and to foster poor environmental behaviors with the reason that you "offset it""	ESEE
Pricing the unpriceable	
"I don't believe in putting a price on carbon emissions. I would rather lower my emissions as low as possible"	ESEE
"[...] Ideologically, I am not in favour of market-based instruments for conservation"	ESEE
Doubts on the effective realization of carbon offsets	
"[...] Once CO_2 from fossil sources is released, any way to store it will not be as long-lasting"	EAERE
"Lack of proof that it is working. Not enough transparency on how this money is invested"	ESEE
"I'm never quite sure where the money really goes"	ESEE
"Simply planting trees won't help, they also need to be cared for"	ESEE
"Want to make sure that offsets are high quality, solid MRV, gold standard, retirement of EUETS or the likes"	ESEE
"The effectiveness of these projects in actually decreasing emissions at the source has been questioned by several scholars"	ESEE
"My skepticism was fully confirmed by the latest Nature article on misuse of JI in Russia/Ukraine. Similarly, I have experienced firsthand practical problems with forestation problems in the tropics"	ESEE

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