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**CAN TEACHERS INFLUENCE STUDENT PERCEPTIONS AND PREFERENCES?
EXPERIMENTAL EVIDENCE FROM A TAXATION COURSE**

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Postal Address:

Institut d’Economia de Barcelona

Facultat d’Economia i Empresa

Universitat de Barcelona

C/ John M. Keynes, 1-11

(08034) Barcelona, Spain

Tel.: + 34 93 403 46 46

ieb@ub.edu

<http://www.ieb.ub.edu>

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ABSTRACT: We explore the impact of university teacher-student interactions on student perceptions of, and preferences with regard to, taxation. Grounded in an experimental framework in which tax practitioners (who are usually hired as adjunct university lecturers) delivered an introductory lecture on an undergraduate tax course, we find that the lectures can impact perceptions, but also preferences if the lecture is of sufficient interest or relevance to engage student attention. Additionally, we find that lectures delivered by practitioners working in the public sector tend to increase student perceptions of tax justice, but that this impact is independent of both the gender of the lecturer and that of the student. However, we deduce the existence of gender bias in evaluating the perceived interest level of lectures. All else being equal, male students typically provide lower ratings for female lecturers, whereas female students tend to give higher ratings for male lecturers.

JEL Codes: A23, H20, I2

Keywords: Tax perceptions/preferences, experimental design, student/teacher gender bias

José M^a Durán-Cabré
Universitat de Barcelona & IEB
Email: jmduran@ub.edu

Alejandro Esteller-Moré
Universitat de Barcelona & IEB
Email: aesteller@ub.edu

Daniel Montolio
Universitat de Barcelona & IEB
Email: montolio@ub.edu

Javier Vázquez-Grenno
Universitat de Barcelona & IEB
Email: jvazquezgrenno@ub.edu

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1. Introduction

A vast literature points to the pivotal role played by teachers as both facilitators and role models in the educational process, highlighting their ability to mould student self-concept, motivation, and overall engagement with both academic and real-world content. Here, exploiting an experimental design, this study reveals the importance of teachers' communication strategies, and of their prior experience of the subject under discussion, in the formation of student perceptions and preferences. More specifically, we explore whether teachers' attitudes and professional experiences in relation to taxation can affect students' preferences and perceptions of this matter.

The experiment is centred on the standard introductory lecture in the field of taxation delivered by tax professionals – a key trait of the adjunct lecturers that teach courses in taxation on both Business Studies and Economics degrees in many Spanish universities. The experiment was conducted with all groups enrolled on such an undergraduate taxation course in the 2022–2023 academic year at the University of Barcelona. In order to ensure the uniformity of the experiment across groups, the content of the lecture and the approach taken to the subject were agreed with the lecturers in advance. Thus, the lectures were based exclusively on the lecturers' experiences as tax professionals and not on any personal preferences. We were also interested in determining whether the “nature” – public *vs* private sector background – of the lecturer also had an impact on student preferences and perceptions. To do so, the lectures were delivered by professionals (to resemble the role played by a university's adjunct lecturer) from both sectors on the understanding that, in the field of taxation, the “nature” of the lecturer and, hence, of the lecture is highly relevant given the different approaches the two professionals – i.e., a public sector tax auditor *vs* a private sector tax advisor – may take towards the management of taxes in society.

In principle, we hypothesize that teachers' lecture can impact students' perceptions and preferences if, for instance, after the lecture students are more aware of the efforts made by the tax authorities to reduce tax fraud, or of the benefits to society of paying taxes. Indeed, our results indicate that if the speaker works in the public sector, students' perceptions about the justice at levying taxes increases.

Likewise, we hypothesized that the *intensity* of the treatment would also be of some importance: thus, if the lecture was sufficiently interesting to the students, their preferences too could be impacted. Specifically, we find that an interesting lecture

increases the marginal willingness to pay taxes and reduces preferences for the abolition of the net wealth tax with respect to a relatively uninteresting lecture. Hence, perceptions, as well as preferences, might change as a result of a lecture.

A priori, such impacts do not seem to depend on the gender of either the lecturer or the student. However, interestingly, we obtained evidence of a gender bias with regards to the revealed interest or impact of the lecture. Thus, female students were more likely to appraise more positively a lecture delivered by a male lecturer than, *ceteris paribus*, one delivered by a female, whereas male students were more likely to appraise more negatively a lecture delivered by a female lecturer than one delivered by a male lecturer. If, however, we amend the original interest revealed by these gender biases and again estimate the impacts on perceptions and on preferences, our basic results do not vary.

Our results should be of utility in discussing practical strategies and interventions that educators and policymakers might employ to enhance positive teacher-student dynamics, highlighting the importance of professional development programs, mentorship initiatives, and most importantly, inclusive teaching practices, that is, involving both public and private sectors. By acknowledging the potential influence teachers wield in the shaping of student perceptions and preferences, this study underscores the need for a student-centred approach in education, where the fostering of supportive, empathetic teacher-student relationships is a fundamental pillar for creating a vibrant, effective learning environment.

The rest of the article is structured as follows: Section 2 reviews the related literature. Section 3 outlines the experiment, providing details about data collection and the sample used. Section 4 presents our results, beginning with a descriptive analysis and followed by our econometric findings. Finally, Section 5 draws together our conclusions.

2. Literature Review

The literature on Economics of Education highlights the impact of teachers on a broad range of student outcomes. Chetty, Friedman and Rockoff (2014) find that students with better teachers (using test score value-added measures) are more likely to attend college, earn significantly more by their twenties, and have a lower probability of having a child as teenagers. Opper (2019), moreover, shows that the impact of teachers extends beyond the actual students in their classrooms, inasmuch as a good teacher can even benefit their students' future peers. More recently, Petek and Pope (2023), using both test and non-test

scores, report that teachers have the potential to enhance a broad range of long-term student outcomes. They also find that the effect of teachers in later grades is greater than that of earlier grades on high school outcomes, and that performance in core elementary subjects is more important than that in other school subjects.

Numerous studies have also focused on gender issues in their analyses of the interactions between students and teachers. Assignment to a same-gender teacher improves the achievements of girls and boys alike, in addition to teacher perceptions of student performance and student engagement with the teacher's subject (Dee, 2007). This impact appears to be significant as students become older and start to understand and apply gender stereotypes (Winters et al., 2013). Moreover, the presence of faculty members of the same gender has a positive impact on course selection and degree choice in some disciplines, thus supporting a possible role-model effect of teachers (Bettinger and Long, 2005). More recently, in a field experiment, Breda *et al.* (2023) show that a one-hour in-class intervention by a woman scientist can improve high school students' perceptions of science careers and significantly increase female participation on STEM degrees courses. The interventions were made by female role models of two distinct types: young scientists working in a private company and young researchers who had been awarded a competitive grant. Interestingly, the former, those with a professional background, were more effective in conveying an attractive image of careers in science and increasing girls' aspirations for such careers.

Teaching economics can also impact students' social values and policy preferences. For instance, there is some empirical evidence that economists are more self-interested and conservative (Girardi *et al.*, 2024). Economics students learn self-interest as the norm for human behaviour, which in the end becomes an instruction about how they have to behave, instead of a description of how they behave. Members of an identity group have normative expectations about what other group members should do and a desire to adjust their behaviour to be norm-consistent (Pickup *et al.*, 2020). However, it is important to determine, in this instance, whether selfishness and conservatism are causal effects of economics education or rather reflect a differential selection into economics. Frey and Meier (2003), Bauman and Rose (2011) and Girardi *et al.* (2024) compare the behaviour and beliefs of students studying economics with those of students enrolled on other courses and find little effect of economics.

Here, we seek to combine these two strands of the literature: that is, the impact of teachers on both the attitudes and preferences of economics students in relation to a

specific topic: taxation. Taxation plays a fundamental role in our economies. The average tax burdens of EU and OECD countries have reached their highest ever values and tax reforms are usually at the heart of the public debate (European Commission, 2023; OECD, 2023). The actions needed to prevent tax evasion and tax avoidance, the use of environmental taxes to fight against climate change and the effect of taxes on efforts to reduce inequality are some of leading issues raised in tax reform debates and are even included in the Sustainable Development Goals of the United Nations. Various studies have sought to determine what people in fact know about taxes. Stantcheva (2021), for instance, assessed individual knowledge of income taxation and estate taxation in the United States. Employing a socio-economic survey to explore patterns of reasoning, she found widespread misunderstanding as regards the level of progressivity. Additionally, she detected interesting heterogeneity patterns: for example, left-leaning respondents consistently underestimated actual taxes and their progressivity in comparison to their right-leaning counterparts.

According to the Public Opinion and Fiscal Policy Survey (CIS, 2023), most citizens in Spain consider taxes essential for funding public services while fewer see them as a tool for achieving better wealth redistribution (59 per cent vs 19 per cent). This belief is slightly stronger among younger individuals (62 per cent vs 15 per cent). However, knowledge about basic tax issues in Spanish society is low, with only around 6 per cent of respondents correctly responding to basic questions in a survey about tax burden, tax mix, and tax design (Durán-Cabré and Esteller-Moré, 2023). There are also notable heterogeneity patterns, with evident biases in relation to gender, political ideology, income, and education. This poor level of knowledge about tax issues is also notable among Spanish third-year undergraduates of Business Studies and Economics (Costa *et al.*, 2011). However, this situation is not unique to Spain, having also been documented in other countries. Thus, Gideon (2017) concludes that most people in the United States do not understand the progressive nature of the federal income tax. In a comprehensive review of 128 primarily empirical studies across different countries, Blaufus *et al.* (2022) find that estimates of taxpayers who accurately perceive their income tax rate range from under 10 to 44 per cent. The lack of knowledge about the tax system even affects decisions-makers in firms, as Fochmann *et al.* (2022) show for Germany, with tax complexity being an important factor to take into consideration.

The increasing weight of taxes and their growing complexity mean both tax auditors and tax advisors have an important role to play in facilitating tax compliance. Tax

advisors might be said to represent the supply side of aggressive tax planning, albeit that their clients (the demand side) can devise their own strategies. Then, a comprehensive understanding of the role played by tax intermediaries is essential (see, OECD, 2008).¹ Moreover, tax intermediaries can, in theory, also play a key role in relation to less complex tax issues, such as the earned income tax credit (EITC), one of the largest cash transfer programs for low-income families in the United States. Chetty and Saez (2013) analysed the impact of the EITC on labour supply behaviour and found that it is influenced not solely by information, but also by advice provided by tax professionals. Indeed, professional tax advisors can significantly shape their clients' earnings choices, suggesting that their advice may have a greater impact on behaviour than the information provided on the EITC handouts themselves.

The experiment described in this paper seeks to provide further evidence of the impact of university lecturers – especially, those with a professional profile and who are key players in the education system – on student perceptions of, and preferences with regard to, taxation, an essential concern in present-day economies. In the future, these students will be taxpayers and, additionally, the professional careers of some will be developed in the field of taxation, either as tax advisors or tax auditors.

3. The Experiment

Our goal here is twofold: on the one hand, we seek to determine whether university students' perceptions of, and preferences with regard to, basic taxation issues are affected by an introductory lecture on the topic, and, on the other, we seek to resolve whether the professional background (public *vs* private sector) of lecturers (in this instance, adjunct university lecturers) has an impact on these perceptions and preferences and, if so, whether the impact depends on the gender of the sender/receiver of the lecture content.

Spanish universities typically hire professionals from both the public and private sectors as adjunct lecturers (*profesor asociado*), given their expertise in a given field. Unlike full-time lecturers, they are only assigned teaching duties, this role being especially important in areas such as taxation given their exposure to the latest developments in professional practice. Their professional experience can provide students with added value; however, the examples these lecturers give their students of

¹ Directive 2018/822/EU, which amends the European Directive on Administrative Cooperation (DAC 6) and lays down new reporting obligations for tax intermediaries in relation to certain potentially abusive cross-border tax schemes, constitutes a clear example of the key role they have to play in compliance.

working with taxpayers or the tax authority might not – albeit unintentionally – be neutral regarding the perception or the formation of preferences towards the public sector.

To test this potential impact, we conducted an in-class experiment which involved comparing students' responses to an on-line survey both before and after a planned lecture delivered by taxation practitioners. The planned lecture replicates the kind of experiences described by an adjunct lecturer to their students when lecturing on the subject of taxation.

3.1. The Structure

The experiment was conducted among students enrolled on the degree in Economics (ECO) during the first semester of the 2022–2023 academic year (early-September 2022), and among those enrolled on the degree in Business Studies (BS) during the second semester (mid-February 2023). More specifically, in the case of the ECO undergraduates, it took place on the first day of the course entitled “*Sistema Fiscal-IP*” and, in the case of the BS undergraduates, on the first day of the course entitled “*Fiscalidad de la Empresa*”. In both cases, the objective of the course is to introduce students to the basic legal rules for filling out personal income tax, corporate income tax and value added tax returns and the approach adopted is eminently practical, and does not require students to interpret the law or deal with procedural tax law.

We conducted the experiment on the first day of the course so as to maximize participation. Most students can be expected to attend that day, as the lecturer provides an outline of the course content and describes how the on-campus lectures will be organized and the method of assessment that will be employed. In both cases, in accordance with the expected pathway designed by the university authorities, this is the third year of a four-year degree and, at least, the second course they have taken in public economics. As such, students can be expected to have some knowledge of basic taxation, including the role, and instruments in the hands, of the public sector. For both sets of students, the structure of the experiment was as follows:

1. One of the authors (in all cases, Alejandro Esteller-Moré, AEM) informed students that, in addition to being given a course outline, they would exceptionally be given a lecture by a practitioner of taxation. This – it was explained – was something new and of obvious relevance and was intended to motivate their interest in the subject.
2. Before this, students were asked to fill out a 10-minute on-line survey (for

more details, see below). AEM explained that this would not be taken into consideration in their final course grade, but that their cooperation would be appreciated as part of an ongoing research project. Students were not given any specific details about the research goals, but it was stressed that there were no right or wrong responses to the survey questions and that their participation was voluntary.

3. The lecturer then delivered his or her 10 to 15-minute talk with the use of slides (for more details, see below).
4. Having completed the lecture, the lecturer left the room, and AEM outlined – as is customary – the course contents, and the day-to-day organization of the course. However, before explaining how they would be assessed, he asked the students to repeat the on-line survey. They were surprised, but most of them answered it in no more than 10 minutes. The rest of the class was then delivered as usual.

Below, we explain in greater detail the characteristics of the on-line survey and of the lecture delivered on the first day of the course.

3.2. The On-line Survey

The survey was delivered on-line and had to be completed, in either Catalan or Spanish, in the classroom both before and after the lecture. Indeed, this was the key element of the experiment: verifying whether students' responses changed in the wake of the lecture and, if so, whether these were contingent on both the nature of the lecturer (private sector *vs* public sector) and on his/her gender and on the students' gender. Most of the students completed the survey on their mobile phones and they raised no doubts or concerns in relation to any of the questions. The questions posed were as follows (the labels given to each being employed below in the empirical analysis):

Perceptions

- **Justice.** To what degree do you agree that, in general, individuals with more resources pay more taxes? From 0 (totally disagree that those with more resources pay more) to 10 (totally agree).
- **Benefit.** Based on your experience and that of your family and acquaintances, to what extent do you think society benefits from the taxes we pay? From 0 (not at all) to 10 (a lot).

- **Perceived fraud.** Based on your experience (that of friends, family or that acquired in your professional field), what percentage of tax fraud do you perceive? From 0 (nothing) to 100 percent (maximum).
- **Effort.** Based on your experience (that of friends, family or that acquired in your professional field), what level of effort do you think is made by the tax authorities to fight tax fraud? From 0 (zero effort) to 10 (maximum effort).

Preferences

- **Inheritance.** To what degree do you agree with the abolition of the inheritance tax? From 0 (totally disagree with the abolition) to 10 (totally agree with the abolition).
- **Wealth.** To what extent do you agree with the abolition of the wealth tax (i.e., the annual tax on an individual's net wealth)?² From 0 (totally disagree with the abolition) to 10 (totally agree with the abolition).
- **Fraud justification.** To what extent do you think tax fraud is justified? From 0 (it is never justified) to 10 (it is always justified).
- **Willingness.** In the future, when you are fully incorporated into the labour market, and taking into account all existing taxes (personal income tax, VAT, etc.), of every 100 euros earned, how many euros would you be willing to pay in taxes?

In the second survey, we additionally asked students to report how interesting the lecture had been for them:

- **Impact.** Finally, has the “keynote address” provided you with relevant information? Make an assessment between 0 (it has not provided me with any relevant information) to 10 (all its content has been completely relevant to me).

The questions tagged **Justice**, **Benefit**, **Perceived fraud** and **Effort** relate to perceptions, while the rest relate to preferences. According to this differentiation, in the empirical analysis we tested whether student perceptions and/or preferences changed in the wake of the lecture. The responses were automatically uploaded onto the course's on-line platform and linked to student gender and group (morning or afternoon shifts).

² In Spain, the inheritance and wealth taxes are national taxes but collected by regional governments, which in addition to raising the revenues enjoy considerable regulatory powers. Thus, some regions have introduced an almost 100 per cent tax credit or significantly reduced the tax rates, while others have opted not to raise the rates. For this reason, significant differences occur between the regions in relation to tax liability. This typically generates a great deal of public debate about the future of the two taxes.

3.3. The Lecture

In Table 1, we show the distribution of lecturers by degree and group. There are more groups in the case of BS (a total of eight, including both morning and afternoon shifts), which meant we were able to incorporate the combination of all lecturer characteristics, i.e., male/private, male/public, female/private and female/public. In the case of ECO, there are fewer groups (a total of four) and it was not possible to incorporate the following combination of lecturer characteristics: male/public and female/private.³

Table 1: Distribution of lecturers by degree and group.

Lecturer	ECO	BS
Female private sector		1M & 1A
Male private sector	1M & 1A	1M & 1A
Female public sector	1M & 1A	1M & 1A
Male public sector		1M & 1A
# Lectures	4	8

Note: M: morning shift; A: afternoon shift.

We held various meetings with the lecturers to ensure uniformity of the lectures, as such they can be considered ‘planned’ talks. More specifically, the lecturers were asked to address two main issues based on their professional experience: 1) the extent to which the taxes levied satisfied the criteria of tax justice and 2) their perceptions of fraud levels and of the efforts taken by the tax authorities to reduce fraud. All lecturers were instructed to base their lectures on their professional experience and not their preferences. To do so, we urged them to draw on practical examples encountered in their professional practice. Indeed, this is what we would expect an adjunct lecturer to transmit – albeit with no explicit intention – to students when lecturing. In this way, we sought to create a situation as similar as possible to an in-person taxation class taught by an adjunct lecturer (i.e., by a professional). To reflect the questions specifically included in the survey, and because this is the professional responsibility of public sector administrators, we asked the lecturers to provide examples related to the wealth and inheritance taxes. Finally, to maximize student attention, and hence the intensity of the treatment, lecturers were asked to illustrate their lecture with appropriate slides.⁴

³ Note, in the case of BS, there are in fact nine groups. For the ninth group the lecture was delivered by a non-practitioner (AEM) and the content was neutral, lacking practical examples, in line with the lecturer’s characteristics. However, unfortunately the number of students present (15) was too small to effectively analyze their responses (i.e. consistency verifications).

⁴ Lectures included a total of 7-8 slides. We reviewed the content of these slides to achieve a certain degree of uniformity across talks, in addition to that provided in terms of the topics addressed and the approach taken. The lectures (in Spanish/Catalan) are available upon request.

At the beginning of the lecture, the lecturers – to ensure their credibility in the eyes of the students – introduced themselves, making it clear they were experts in the field. Thus, the female public sector lecturer for both ECO and BS students works in the Catalan Tax Agency (ATC), as does the male lecturer for the BS students. The female and male private sector lecturers for both ECO and BS students have more than twenty years of professional experience. Lecturers did not accept any questions from the students either during or at the end of the lecture (to avoid distracting from the lecture content itself), and they were asked not to provide any data (official or otherwise) as this would be an obvious way of conditioning survey responses.

3.4. Survey responses: number and composition by degree course

Table 2 describes the total number of responses by degree: 92 in the case of ECO and 262 in the case of BS.⁵ The rate of response (number of responses provided by enrolled students) was similar on both degrees: 34.6 per cent for ECO and 33.2 per cent for BS – a relatively low rate in relation to our expectations. This reflects the fact that some students arrived late (once the initial survey was underway), some only completed this first survey and, most significantly, the poor rate of attendance at on-campus lectures from the first day of the course.⁶

Overall, the total number of observations included in the empirical analysis is 354. We also exploit the gender of the respondents: thus, we have 182 male and 172 female students.

Table 2: Number and distribution of responses by degree

Lecturer	ECO	BS
Female private		84
Male private	34	59
Female public	58	68
Male public		51
#observations	92	262

4. Results

4.1. Descriptive analysis: pre-lecture

Table 3 provides summary statistics for the student sample surveyed herein (Panel A). The sample is well-balanced in terms of gender (48.6 per cent female), nearly 75 per cent

⁵ Students who only responded to the survey before the lecture and, thus, were discarded from the sample.

⁶ Attendance rates in our faculty have fallen since the pandemic, a trend repeated in many Spanish universities. See, for example, the editorial “*Universidades sin universitarios*” from *El País* on 16 December 2023.

of the participants are business students, and a slightly higher percentage of students enrolled on both degrees attend morning groups. Half of the sample were lectured by a practitioner working in the private sector, while the other half were lectured by a practitioner working in the public sector (ATC).

Table 3: Summary statistics of the sample and of survey responses

Panel A		Sample characteristics	
Female		0.486	
Economics vs Business degree		0.260	
Morning shift		0.571	
Private vs public sector lecturer		0.500	
Female lecturer		0.593	
Observations		354	

Panel B		Gender	
	Male	Female	p-value
<i>Perceptions</i>			
Justice	7.018	6.997	0.935
Benefit	5.936	6.424	0.007
Perceived fraud	39.766	38.372	0.667
Effort	6.170	5.712	0.050
<i>Preferences</i>			
Inheritance	7.181	6.799	0.243
Wealth	5.220	5.445	0.487
Fraud justification	4.016	3.203	0.005
Willingness	18.654	15.424	0.005
Observations	182	172	

Panel C		Field of study	
	Business	Economics	p-value
<i>Perceptions</i>			
Justice	7.091	6.772	0.267
Benefit	6.162	6.207	0.827
Perceived fraud	36.784	45.652	0.016
Effort	6.063	5.620	0.097
<i>Preferences</i>			
Inheritance	6.926	7.196	0.469
Wealth	5.441	5.011	0.243
Fraud justification	3.666	3.495	0.604
Willingness	15.756	20.870	<0.001
Observations	262	92	

Panel B of Table 3 presents average responses, differentiating by student gender, to the main survey questions (columns 1 and 2). Column 3 provides *p*-values for the null hypothesis that responses are equal for both genders. As is evident, there are no gender

differences in response to four of the eight questions (justice, abolition of the inheritance and wealth taxes, and perceived fraud). However, in the case of the remaining four questions, gender differences are statistically significant. Specifically, male students are more likely to find justification for fiscal fraud and report a greater perception of efforts to reduce tax fraud and a greater willingness to pay taxes. Conversely, females report a greater perception of the benefits derived from taxes.

Adhering to the same structure as the previous panel, Panel C presents analogous information but here differentiates between students majoring in BS, on the one hand, and ECO, on the other. Here, notable disparities emerge in the students' respective responses with regards, above all, to their willingness to pay taxes and their perception of fraud: BS students declaring themselves less willing to pay taxes and reporting a lower perception of fraud. Additionally, disparities are significant in their respective perceptions of efforts to reduce fraud, with BS students recording a higher perception.

To further explore the pre-intervention descriptive statistics, we conducted a non-parametric analysis comparing the relative densities of student responses based on gender and on their field of study. This analysis aims to discern whether, despite the observed differences (or lack thereof) in average terms, variations exist across the entire distribution of responses for both males and females, as well as for ECO and BS students.

Figure 1 presents a comparison of the relative densities for each survey question, distinguishing by gender. In the case of the perceived benefits of taxation, a distinction emerges primarily at the lower end of the response distribution, where females are underrepresented relative to the male distribution, specifically presenting a smaller density below the 10 per cent male quantile. Conversely, in responses concerning the justification of fraud and the fight against tax fraud, differences emerge at the upper end of the distribution, with females being noticeably underrepresented compared to their male counterparts. As for the willingness to pay taxes, differences are observed across the entire distribution, with females overrepresented at the bottom and underrepresented at the top relative to males.

Although on average we did not detect any differences in certain responses, the non-parametric analysis reveals nuanced distinctions. For instance, in the case of the abolition of the inheritance tax, females are overrepresented in the middle of the distribution (between the 20th and 60th percentiles); however, they are underrepresented in the top 30th percentile. These findings highlight subtle variations not apparent in the analysis of means (Table 1, Panel B).

Figure 1: Relative Densities by gender

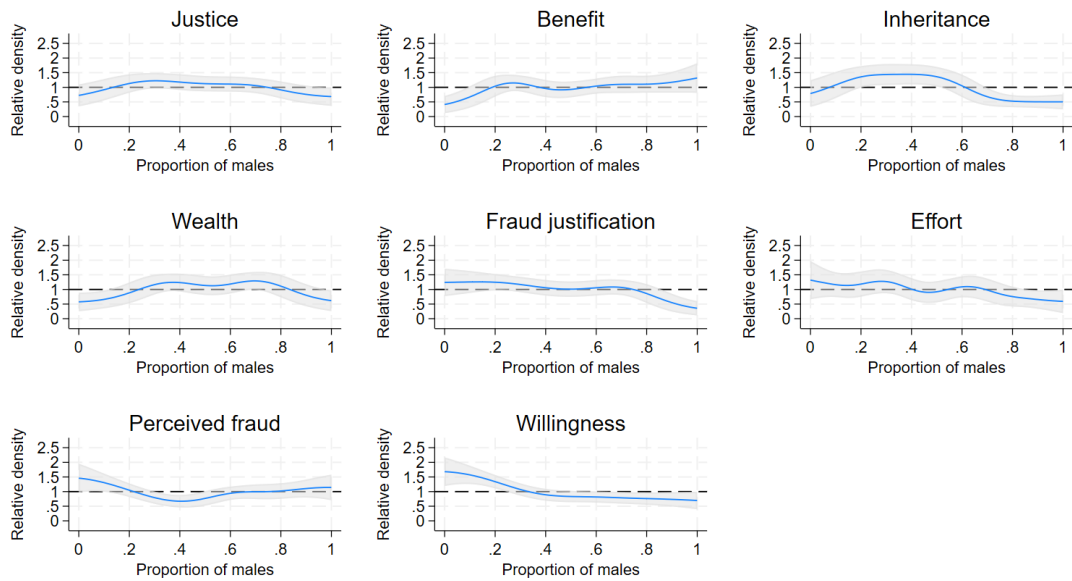
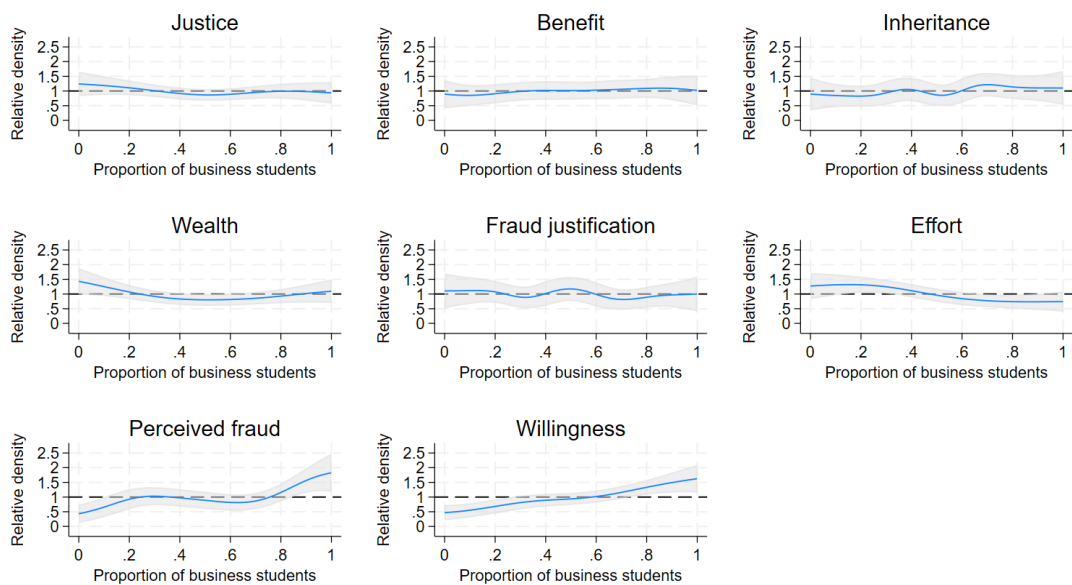


Figure 2 provides similar comparisons to those shown in Figure 1, but here distinguishing by field of study. In the case of perceptions of tax fraud, distinctions emerge at the lower end of the distribution, with ECO students being underrepresented relative to BS students, while the opposite is the case at the top of the distribution. Clear differences in willingness to pay taxes are evident across the entire distribution, with ECO students being underrepresented below the median and overrepresented above it relative to BS students. The distributions of the other responses appear to be largely similar in the two fields of study.

Figure 2: Relative Densities by field



Given these differences, in the following section, we conduct a parametric analysis to test whether a lecture can vary student perceptions of, and preferences as regards, taxation issues.

4.2. Changes in perceptions and preferences: pre- and post-lecture

4.2.1. Methodology

More formally, our first step involves analysing whether the lecture, regardless of its nature (private *vs* public) and regardless of the gender of the lecturer and the student, impacted student perceptions and preferences. To do so, we perform a standard ‘before-after’ regression:

$$\Delta Response_i = \gamma Lecture_i + X_i\beta + \mu_i \quad [1]$$

where i is the individual surveyed and μ_i is the error term with the usual statistical properties. The dependent variable is the difference (after minus before) in the response given to the corresponding question. This depends on the parametrization of the response (either from 0 to 10 or 0 to 100), so that the variable ranges from +10 to -10 or from +100 to -100, where 0 corresponds to the case where there is no change in the response after the *Lecture* (i.e., the treatment). As discussed in Section 3, the experiment was carried out on the first day of class to maximize participation; however, despite this, participation was low at around 34 per cent of the total number of students enrolled. Moreover, we were unable to oblige students to participate in both rounds of the experiment. Thus, as we cannot guarantee that this constitutes a random sample of all students enrolled on the course, the error term might be correlated with our estimate of interest, γ . For this reason, to avoid the potential bias of the estimate, in equation [1], we control for the students’ variables at our disposal (i.e., degree, gender, and shift), X_i . Our purpose in so doing is to test whether γ is different from zero.

We also wish to test whether the impact (if any) and its sign depend on the characteristics of the treatment (public *vs* private; and gender of the student and of the lecturer). In order to test for the existence of heterogenous impacts, we implement a fully-fledged model, that is, we interact the *Lecture* and each control variable with the corresponding source of heterogeneity. Next, we present the results of our empirical estimations.

4.2.2. Impact of the Lecture

Table 4 presents the results of estimating equation [1]. Thus, the lecture had a positive impact on student perceptions of the benefits of taxation and of the efforts exerted by the tax authorities to reduce tax fraud; however, it had no discernible impact on student preferences with regards to taxation (columns 5 to 8), indicating that, as expected, preferences are less mouldable than perceptions.

These estimates, though, might be conditioned by the level of interest generated by the lecture in the students. In other words, we might not find statistically significant changes in responses as the lecture was not ‘sufficiently’ interesting to students. To test this hypothesis, we perform a complementary analysis. To do so, as explained above in Section 4.2.1, we interact all the variables with a dummy equal to one if we deem the lecture was interesting to the *i*-student, that is, if the response given to the question *Impact* (see section 3.2) is above 8 (median value). Results considering the intensity of the treatment are shown in Table 5.

Table 4: Impact of the lecture on the different margins (dependent variable: difference after-before)

VARIABLES	CHANGE IN PERCEPTIONS				CHANGE IN PREFERENCES			
	(1) Justice	(2) Benefit	(3) Perceived fraud	(4) Effort	(5) Inheritance tax	(6) Wealth tax	(7) Fraud justification	(8) Willingness
Lecture	0.229 (0.203)	0.199* (0.119)	-1.239 (2.406)	0.630*** (0.166)	0.301 (0.212)	0.093 (0.195)	0.108 (0.159)	0.292 (0.459)
Observations	354	354	354	354	354	354	354	354
R-squared	0.005	0.039	0.015	0.103	0.015	0.009	0.009	0.002

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. We control by shift, gender (of the students surveyed) and degree (BS or ECO).

As is evident, this additional analysis does not add anything to our study of changes in student perceptions, the results remaining unchanged albeit with a slight loss of precision in the case of the estimate of perceived *Benefit*. However, in the case of student preferences, some of the dimensions undergo a change if the lecture was deemed interesting to the student. This is a relevant finding insofar as it shows that a ‘compelling’ lecture can impact student preferences. Preferences generally seem less mouldable, but this result suggests that under certain circumstance they can be influenced. More specifically, among students who considered the lecture interesting, the marginal willingness to pay taxes (MWTP) increased by 1.945 points (this variable, recall, ranges

from 0–100, and the before mean value is 17.18), while a preference for the abolishment of the net wealth tax fell by 0.855 points (this variable ranges from 0–10, and the before mean value is 5.34). Hence, with respect to those for whom the lecture was not so interesting, a ‘compelling’ lecture favours an increase in the MWTP and lowers the preference to abolish the wealth tax. These results suggest that a lecture might not be neutral towards student preferences if it is sufficiently compelling.

Table 5: Impact of the lecture on the different margins (dependent variable: difference after-before), contingent on the interest of the talk

VARIABLES	CHANGE IN PERCEPTIONS				CHANGE IN PREFERENCES			
	(1) Justice	(2) Benefit	(3) Perceived fraud	(4) Effort	(5) Inheritance tax	(6) Wealth tax	(7) Fraud justification	(8) Willingness
Lecture	0.313 (0.273)	0.121 (0.153)	-2.688 (2.967)	0.685*** (0.220)	0.288 (0.275)	0.428* (0.240)	-0.0269 (0.203)	-0.441 (0.615)
Lecture x Interest	-0.152 (0.394)	0.216 (0.247)	3.915 (5.091)	-0.126 (0.334)	0.0944 (0.438)	-0.855** (0.404)	0.327 (0.330)	1.945** (0.905)
Observations	354	354	354	354	354	354	354	354
R-squared	0.044	0.046	0.019	0.117	0.027	0.021	0.018	0.013

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. We control by shift, gender (of the students surveyed) and degree (BS or ECO) and each control is interacted with *Interesting*, a dummy variable equal to one if the value of *Impact* is greater than or equal to 8 (out of 10).

Impact of the Lecture: Private vs Public

Adjunct lecturers, as we have seen, might be employed in either the private or public sectors. This being the case, their respective professional day-to-day experiences might be partially ‘contradictory’, as might the visions they, as a consequence, transmit to their students. In Table 6, we test whether the impact of the treatment (i.e. the tax lecture) differs depending on the characteristics (or ‘nature’) of the lecturer. Again, without controlling for the interest generated in the students by the lecture, we find no statistically significant impact on student preferences, independently, that is, of the nature of the lecturer.

In the case of student perceptions, results regarding the effort made by the tax authorities to fight fraud (*Effort*) remain unchanged, and we find no differential impact by the nature of the lecture (i.e., delivered by private vs public practitioner). Note that while a lecture delivered by a private sector professional seems to impact less (-0.286) on this perception, the difference is not statistically significant. In the case of the perception

of the benefits of paying taxes (*Benefit*) any effect disappears when we perform the heterogeneity analysis, although there is no differential impact here either. Interestingly, if the lecture is given by a public sector practitioner, students' perceptions of the fairness of the system (*Justice*) increase by 0.561 points (the before mean of this variable is 6.98). This impact is statistically different from that attributable to a lecture delivered by a private tax practitioner, -0.289 (i.e., 0.561-0.850). Hence, the nature of the lecture – that is, whether the adjunct lecturer works in either the private or public sector – is not neutral at least towards a key perception, that of tax justice. In general, when we combine the level of interest generated by the lecture and the nature of the lecture, our results remain unchanged; however, we do lose some statistical precision.⁷

Table 6: Impact of the lecture on the different margins (dependent variable: difference after-before), contingent on private vs public talk

VARIABLES	CHANGE IN PERCEPTIONS				CHANGE IN PREFERENCES			
	(1) Justice	(2) Benefit	(3) Perceived fraud	(4) Effort	(5) Inheritance tax	(6) Wealth tax	(7) Fraud justification	(8) Willingness
Lecture	0.561*	0.123	-3.444	0.739***	0.351	0.0382	0.0286	-0.126
	(0.286)	(0.157)	(2.634)	(0.233)	(0.261)	(0.249)	(0.215)	(0.595)
Lecture x Private	-0.850**	0.146	5.042	-0.286	-0.349	0.00310	0.184	0.685
	(0.375)	(0.245)	(5.539)	(0.334)	(0.427)	(0.391)	(0.318)	(0.899)
Observations	354	354	354	354	354	354	354	354
R-squared	0.049	0.044	0.025	0.109	0.034	0.023	0.020	0.013

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. We control by shift, gender (of the students surveyed) and degree (BS or ECO) and each control is interacted with *Private*.

Impact of the Lecture: Gender issues

An interesting issue to examine is the role played by gender – both that of the lecturer and of the student – on student perceptions and preferences. Table 7 shows no differential impact in perceptions according to the gender of the student, while as regards preferences, female student support for the abolition of the net wealth tax in the wake of the lecture is weakened (column 6, row 2 in Table 7).

Likewise, according to the findings presented in Table 8, there is no discernible differential impact attributable to the gender of the lecturer. Thus, considerations concerning gender, whether from the perspective of the receiver or the sender of the

⁷ These results are available upon request.

message, do not appear to play a significant role in shaping either student perceptions or student preferences with regard to taxation.

Table 7: Impact of the lecture on the different margins (dependent variable: difference after-before), contingent on student gender

VARIABLES	CHANGE IN PERCEPTIONS				CHANGE IN PREFERENCES			
	(1) Justice	(2) Benefit	(3) Perceived fraud	(4) Effort	(5) Inheritance tax	(6) Wealth tax	(7) Fraud justification	(8) Willingness
Lecture	0.366 (0.239)	0.164 (0.140)	-2.851 (2.776)	0.581*** (0.199)	0.211 (0.237)	0.250 (0.223)	0.157 (0.185)	-0.255 (0.544)
Lecture x Fem. Student	-0.390 (0.314)	0.184 (0.195)	1.857 (3.668)	0.0548 (0.271)	-0.194 (0.349)	-0.688* (0.351)	-0.0321 (0.264)	0.956 (0.811)
Observations	354	354	354	354	354	354	354	354
R-squared	0.009	0.040	0.023	0.104	0.016	0.013	0.010	0.010

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. We control by shift, gender (of the students surveyed) and degree (BS or ECO) and each control is interacted with *Gender* (equal to 1 if female student).

Table 8: Impact of the lecture on the different margins (dependent variable: difference after-before), contingent on the gender of the lecturer

VARIABLES	CHANGE IN PERCEPTIONS				CHANGE IN PREFERENCES			
	(1) Justice	(2) Benefit	(3) Perceived fraud	(4) Effort	(5) Inheritance tax	(6) Wealth tax	(7) Fraud justification	(8) Willingness
Lecture	0.201 (0.225)	0.0139 (0.196)	0.701 (3.486)	0.293 (0.229)	-0.0906 (0.243)	-0.0853 (0.255)	0.392 (0.260)	0.162 (0.543)
Lecture x Fem. Lecturer	0.215 (0.431)	0.386 (0.268)	-3.348 (5.274)	0.459 (0.372)	0.525 (0.475)	0.455 (0.421)	-0.507 (0.353)	0.166 (1.012)
Observations	262	262	262	262	262	262	262	262
R-squared	0.026	0.069	0.020	0.104	0.031	0.049	0.013	0.005

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. We control by shift, gender (of the students surveyed, and of the lecturer) and degree (BS or ECO) and each control is interacted with the *Gender* of the lecturer (equal to 1 if female).

Lecture Interest: Gender bias

While we find that gender plays no role in moulding student preferences and perceptions, we were interested in determining whether there is a bias in the assessment of the lecture based on lecturer and student genders. To test this hypothesis, we estimate an equation in which the dependent variable is *Impact* (0–10) and the explanatory variables are the controls used in the previous estimates. However, in this instance, in the case of the *Gender* variable, we interact the genders of the lecturer and the student (i.e.,

‘Male Lecturer x Male Student’, ‘Male Lecturer x Female Student’, ‘Female Lecturer x Male Student’ and ‘Female Lecturer x Female Student’). In the absence of any assessment bias, given either the gender of the lecturer or the gender of the student, the estimates of that variable based on the gender of the other party should be statistically insignificant. Our base category is ‘Female Lecturer x Female Student’. Results are shown in Table 9.

According to the base category, *ceteris paribus*, column (1) shows that the assessment of ‘Female Lecturer x Female Student’ is 6.978 (the average *Impact* being 7.16). This assessment of a ‘Female Lecturer’, though, is dependent on the gender of the student receiver: if the receiver is male, the assessment falls to 6.277 (6.978-0.701). Thus, males find talks delivered by female lecturers less interesting or relevant.

In contrast, the assessment made by female students of male lecturers stands at 7.992 (i.e., the base category plus ‘Male Lecturer x Female Student’, 6.978+1.014). *Ceteris paribus*, this response is higher and statistically different from the score awarded by female students to a female lecturer. Finally, there is no bias in the mark given by male students to male lecturers.

Table 9: Bias in assessments (*Impact*: score awarded to the lecture on a scale from 0 to 10), depending on the gender of the lecturer and of the student

VARIABLES	(1) Impact	(2) Impact
Shift (morning=1)	0.361** (0.166)	0.374** (0.165)
Degree (economics = 1)	0.0303 (0.189)	-. -
Male Lecturer & Male student	-0.251 (0.229)	-. -
Male Lecturer & Female student	1.014*** (0.240)	1.119*** (0.219)
Female Lecturer & Male student	-0.701*** (0.215)	-0.591*** (0.188)
Constant	6.978*** (0.180)	6.872*** (0.145)
Observations	708	708
R-squared	0.070	0.069

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

All in all, the revealed interest generated by the lecture is gender biased. *Ceteris paribus*, the interest of female students tends to increase (or they tend to attach greater credibility to the message) if the lecturer is male, while the interest of male students in the talk tends to decrease if the lecturer is female. These results remain unaltered when

we discard those variables that are statistically insignificant (see column (2) of Table 9).

Are these biases of any relevance to our outcomes estimating the impact of a lecture? To test for this, we replicate Table 5 where ‘Interesting’ is now corrected for gender bias using the estimates from column (1) in Table 9. More specifically, the original variable *Impact* is reduced by 1.014 if the lecturer is male and the surveyed student is female, and it is increased by 0.701 if the lecturer is female and the surveyed student is male. These results are shown in Table 10. The only difference occurs in relation to *Justice*, with estimates statistically significant at the 90 per cent level. Hence, the gender bias does not seem to be strong enough to affect our original estimates of the lecture based on how interesting students found it.

Table 10: Impact of the lecture on the different margins (dependent variable: after-before), contingent on the interest of the lecture corrected by gender bias

VARIABLES	CHANGE IN PERCEPTIONS				CHANGE IN PREFERENCES			
	(1) Justice	(2) Benefit	(3) Perceived fraud	(4) Effort	(5) Inheritance tax	(6) Wealth tax	(7) Fraud justification	(8) Willingness
Lecture	0.549*	0.156	-2.523	0.638***	0.106	0.326	-0.0235	-0.677
	(0.306)	(0.172)	(3.186)	(0.230)	(0.208)	(0.236)	(0.222)	(0.690)
Lecture x interest w/o gender bias	-0.700*	0.111	2.899	0.000112	0.379	-0.479	0.277	2.107**
	(0.400)	(0.238)	(4.857)	(0.335)	(0.438)	(0.404)	(0.316)	(0.899)
Observations	354	354	354	354	354	354	354	354
R-squared	0.042	0.043	0.017	0.111	0.022	0.013	0.019	0.018

Note: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. We control by shift, gender (of the student surveyed) and degree (BS or ECO) and each control is interacted with Interesting without gender bias.

5. Conclusions

In a not too distant future, university students studying Economics will become taxpayers and, indeed, some may be employed as advisors to taxpayers informing them of their fiscal responsibilities. This means that the willingness of taxpayers to fulfil their obligations and pay their taxes might be influenced by the perceptions these students have of the role played by the public sector. As has been demonstrated with other outcomes, university lecturers can significantly shape these perceptions. For this reason, it is critical that we seek to understand the extent to which teachers can influence the current preferences and perceptions of their students.

Here, we conducted an in-class experiment to test this hypothesis. We sought to replicate as closely as possible the traits and conditions of a lecture delivered by an

adjunct lecturer. Such lecturers present quite distinctive characteristics to those of regular faculty. Thus, they are able to provide real world examples from their day-to-day professional experiences, while the nature of these examples is likely to vary depending on whether they are employed in the private or public sectors. All in all, the impact of these lecturers – typically in a majority on university taxation courses – is quite different from that of other faculty lecturers.

Teacher talk – as a replica of a standard lecture – might change perceptions. Here, in the wake of the lecture, students were found to be more aware of the benefits of paying taxes and of the efforts taken by the tax authorities to combat tax fraud. These outcomes are encouraging as far as fostering future tax compliance is concerned. Moreover, these results were consistent regardless of the intensity of the treatment (i.e., how interesting the students considered the lecture to be) and the sector of activity (public vs private) in which the lecturer was engaged. However, we detected an interesting source of heterogeneity: when the lecture was delivered by a public sector practitioner, the perception of tax justice increased, whereas the impact on student perceptions of justice tended to be null when the lecture was delivered by a private sector practitioner. Indeed, the difference between these two impacts was statistically different. As expected, we found preferences to be less mouldable than perceptions; yet, if the talk was deemed interesting by the students, preferences too could be modified. Thus, a compelling lecture was found to induce a greater willingness to pay taxes and to reduce the preference for abolishing the net wealth tax.

Neither student preferences nor perceptions were found to be affected by gender issues; however, taking advantage of our experiment, we tested another hypothesis: whether student assessments of a lecture are gender biased. Here, our estimates revealed major biases: *ceteris paribus*, male students tend not to rate female lecturers as highly, while female students tend to rate male lecturers more highly. Although this finding might be important for other outcomes not directly addressed herein, the acknowledgment of these biases does not significantly impact the formation of perceptions of, or preferences with regards to, the public sector attributable to the lecture delivered on the taxation courses.

Overall, we provide evidence of teacher impact on certain margins: namely student perceptions of, and preferences with regards to, the public sector and, more specifically,

taxation. However, this impact holds most clearly for only some of these margins,⁸ most notably student perceptions. Unfortunately, we have no way of ensuring this impact endures. This would appear to merit further research.

⁸ The presence of an impact on certain margins and not on others might be caused by the specific emphasis given by the lecturers to concerns related to these margins during their lecture, or by the greater intrinsic malleability of the margins that change. In any case, for empirical purposes, what is relevant is that *some* margins change.

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