Woman to Woman: Teaching Assistants as Role Models in Economics

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Abstract

Given the low female participation in the economics profession, female undergraduate students are exposed to very few female role models that inspire them to pursue a career in economics. Based on data from a university in Santiago de Chile, and using a differences-in-differences strategy, I studied whether exposure to female assistants has an effect on the probability of choosing the major of Economics within the Commercial Engineering professional career among the female students. I found evidence that having been exposed to at least one female assistant in economics courses increases women's probability of choosing economics by 6.6 percentage points. This is a first approach to be able to replicate experiments aimed at increasing the percentage of women who specialize in economics in Chile.

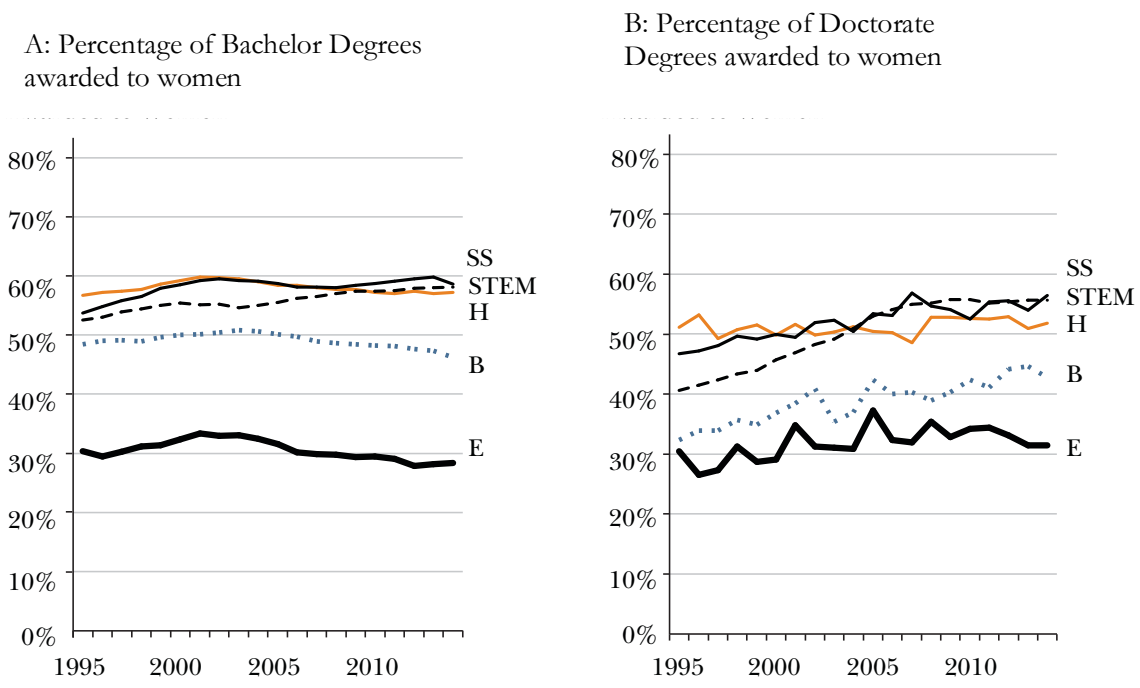
[1] I thank my guide teacher Andrea Repetto for guiding me during all this process. I also thank my teachers Juan Pedro Eberhard and Gonzalo Islas for outstanding guidance too. To José Miguel Cruchaga and Pamela Maraboli for helping with the data, and to Adolfo Ibañez University for providing it.

1 Introduction

Women have historically been underrepresented in some professional careers. Specifically, there is low female participation in careers related to mathematics, science, economics and computing. Women tend to prefer artistic and humanistic careers over those just mentioned (Bettinger and Long, 2005; Wiswall and Zafar, 2011).

Although the situation of women in the academic and working world has evolved, something special is happening in economics. For multiple reasons, women tend not to choose it. Although female participation in STEM careers has increased in the recent years, economics continues to lag behind. In the United States, only a third of the economics[2] Bachelor's degrees are awarded to women, while in STEM majors this percentage reaches almost 60%. As seen in figure 1, this fraction has been maintained in the last two decades in economics, while other sciences have seen an increase. Something similar happens with PhDs; the fraction of about a third awarded to women remains for economics, while in STEM it corresponds to 56% (Bayer and Rouse, 2016). Notably, the gender gap is larger in economics than in other areas.

Figure 1: Degrees awarded to women in the U.S.A., 1995 – 2015.



Source: Bayer y Rouse, 2016
Note: SS (Social Science) STEM (Science, Technology, Engenieering and Mathematics), H (Humanities), B (Bussiness) y E (Economics).

In the best 5 economics schools of the world (Megraoui, 2019) the percentage of female teachers does not exceed 20%. On average they are only 15%, that is: 15.78% at Harvard, 15.38% at MIT,

[2] Particularly in this study Economics is not considered within STEM.

12.5% at Stanford, 19.27% at Berkeley and 12.5% at Chicago[3]. On the other hand, the only woman in the top 100 most cited economists of IDEAS.com is Esther Duflo, in position 97 (March 2020). She is also one of the only 2 women to have won the Nobel Prize in Economics (2.4% of the total Nobel Prize in Economics).

In the case of Chile, this problem does not seem to be different. At both the University of Chile and the Catholic University of Chile[4], all economics tenure professors are men. In the Department of Industrial Engineering of the University of Chile there is only one female tenure professor, which corresponds to 10%. At Adolfo Ibáñez University, there are two female tenure professors, which corresponds to 28.5%[1]. Outside of academia, the positions of President of the Central Bank of Chile and Minister of Finance have never been held by a woman, despite the age of these: 95 and 203 years respectively. For its part, the Ministry of Economics has been headed by a woman on only one occasion in its 90 years of operation.

A growing body of literature has been devoted to exploring this question: what is driving women away from economics? Is it an unattractive career for women? Or do they have fewer opportunities to develop in it? According to Dynan and Rouse (1997), women come to college with certain perceptions of economics as a career that make them discard it from the beginning. In a survey of female college students in their final years of college, they were asked why they never took a Principles of Economics course, and it was found that female students are more than twice as likely as men to say that they "didn't think economics was interesting". Perceived interest in a subject is considered key in career choice (Calkins and Welki, 2006), and women tend to have a more negative predisposition towards economics than men (Bansak and Starr, 2010). Even so, there are studies that show that they have no differences in performance with respect to boys in introductory courses (Bollinger et al., 2006).

On the other hand, many allude to the fact that the environment in economics is more hostile and aggressive towards women than towards men, evaluating them with different standards than their male counterparts. For example, Sarsons (2017) in her study related to journal articles in mixed co-authorship in gender –where the individual contribution of each author is not clear– shows that men tend to obtain more credit than women. However, both men and women receive equal credit for self-written academic articles. In particular, the study finds that having an additional academic publication (in mixed co-authorship) is correlated with an 8% increase in the probability of obtaining tenure for men, but only 2% for women. This gap is less pronounced when women co-authored with other women, suggesting that credit attribution is related to gender. There is also evidence that women in economics write clearer than men, but because they are exposed to higher standard in journals reviews, in addition to spending 6 more months than male economists in the review process in the most prestigious journals (Hengel, 2017). Also, a woman is less likely to be promoted in an academic career, even conditional on productivity (Wolfers, 2015). Added to all of this, in seminars, women tend to face more –and more hostile– questions than men (Dupas et al., 2020).

Along the same lines, Wu (2019) analyzed the comments of an economic forum called EconJobRumors.com. The forum works as a tool to share information about job opportunities and recommendations from colleagues within the profession, through comments posted anonymously and in an informal way. The study found that while comments were more likely to describe men with

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[3] Information retrieved from the official websites of each University: https://economics.harvard.edu/people/people-type/faculty , http://economics.mit.edu/faculty, https://economics.stanford.edu/people/faculty, https://economics.uchicago.edu/directories/full/faculty , https://www.econ.berkeley.edu/faculty/list , http://www.dii.uchile.cl/academicos/listado-de-academicos , http://www.fen.uchile.cl/es/academicos- investigacion/directorio-de-academicos/2 , https://negocios.uai.cl/academicos-e-investigacion/cuerpo-academico/, http://economiayadministracion.uc.cl/?s=&filtros=full-time&post_type=docente .

[4] Best two universities of the country.

words like "advisor", "mathematician", "Nobel" and "macroeconomics", women were more likely to be described as "hot", "beautiful", "married", "pregnant" and other physical and family related characteristics.

Given all that has been exposed so far, and as a consequence of the low female participation in economics, female undergraduate students are exposed to very few female teachers. This is worrying because male dominance in an area can discourage women from entering it, and lack of contact with successful women can lead younger women to believe that they will not be successful in that area (Blau, Ferber and Winkler, 2013). Indeed, a survey on the profession indicates that the main factors that contribute to the low representation of women in economics are the perception of women that there are few role models and the lack of confidence in their ability for economics (Haslehurst et al., 1999).

There is a broad literature that explores the effects of role models in major choice of different careers including economics, finding a positive impact for female students with female teachers in careers traditionally dominated by men (Bettinger and Long, 2005; Dynan and Rouse, 1997; Neumark and Gardecki, 1998; Paredes, 2014; Carrel, Page and West, 2010, Breda et al., 2018).

This work goes one step further by studying whether teaching assistants can fulfill this role. Specifically, if female teaching assistants can be a role model for their female students to follow the path of economics. A role model must meet certain characteristics to cause an effect on those who observes it. In particular, they should represent the possible and be inspiring (Morgenroth, Ryan & Peters, 2015). In addition, the learner must be able to identify with the model, that is, they must come from similar contexts. In the case of teaching assistants, they are students who are characterized by having had an outstanding performance in the subject they teach, have experience, can answer questions, guide, etc. Unlike teachers, the teaching assistants have an age closeness with the students that results in a much easier identification with them.

In this context, I studied the major choice in Economics versus Business Administration in the Commercial Engineering career at a Chilean university. The central idea of this thesis is to determine empirically whether exposure to female assistants affects the probability of female students to enroll in the major of Economics relative to male students. To study the effect of the role model, I compared male students with female students, under the hypothesis that since the economic area has a male dominance, the gender of the role model is a relevant characteristic for female students to feel identified, in this case, with their female teaching assistants. Using a difference-in-differences strategy, I studied in which courses it would matter having had a female assistant for purposes of undergraduate major choice and in which not. Directly, the assignment of assistants is exogenous to the preferences of the students, since the process of selecting teaching assistants is after the course enrollment process. Indirectly, it is a concern that this assignment may not be random since students choose their teachers and teachers may have gender bias in choosing their assistants. Although I took care of this concern by analyzing the possible biases that may exist in the selection of assistants, it must be taken into account when analyzing the results.

Results indicate that there is a positive and significant effect for initial economic courses. Having had a female assistant in Microeconomics I increases the probability of choosing economics by 4.5 percentage points more for women than for men, and by 6.6 percentage points for having had at least one female assistant in the economic area (Introduction to Economics and Microeconomics I). I found a negative effect on the choice of the economics major of having female assistant in the course of Microeconomics II, which is temporarily much closer to the point of major choice than Microeconomics I. Consequently, it seems that the impact of modeling is strongest in periods not so close to the time of decision, plus, the contents of this course seem to be more related to the business administration major, in comparison with Microeconomics I, which is strictly related with economics itself. I did not find effects for mathematical courses or for courses not directly related to economics such as Introduction to Business, Entrepreneurship Workshop and Accounting I. It should be noted

that female students of the Bachelor of Economics were much more exposed to female assistants compared to the total number of female students. That is, 84% in Introduction to Economics and 89% in Microeconomics I, while for the total these percentages are 73% and 76%, respectively.

The rest of the thesis is organized as follows. Section 2 reviews the literature. Section 3 describes the context, explaining the Chilean admission system, the nature of economic training in Chile, and the role of teaching assistants. Section 4 describes the data and presents descriptive statistics. Section 5 describes the methodology while section 6 describes the results and robustness checks. Finally, section 7 concludes.

2 Related Literature

The literature defines role models based on multiple characteristics, especially coming from social psychology. In general, these are people who influence the behavior of others simply by being exposed to them (Bandura and Walters, 1936; Merton, 1957). When a person observes that the behavior of a model has been successful, their motivation increases, and this is one of the key drivers in determining how successful the efforts to model a behavior are (Bandura, 1977). Likewise, it must be someone who has the experience and technique that the other person does not have (or thinks they do not have), but can learn through observation and comparison (Kemper, 1968). The observer notices the behavior of his model in the original situation, to be later influenced by that behavior in many other generic situations (Brophy, 1977).

Several studies have analyzed the effects of role models in various contexts. Nguyen (2008) shows how in Madagascar the perceived returns to education increase by exposing fourth grade students and their parents to role models of similar socioeconomic origin and how incentives to education are strengthened when families underestimate true returns. There is also evidence of exposure to models through TV under an inspirational mechanism. In Brazil, a study shows that exposure to soap operas where the majority of the main characters had one or no child significantly reduces women fertility (La Ferrera, Chong and Duryea, 2012). Bernard et al. (2014) conducted an experiment in rural Ethiopia. Individuals were randomly invited to watch a documentary of communities similar to their own that had been successful in agriculture or business, without help from the state or NGOs. They found an increase in the aspirations of the treated group, unchanged for the control group. This translated into higher savings, use of credit, children's schooling, and spending on education. Riley (2017) shows evidence of how in Uganda, exposing students to a film with a female role model significantly increases the academic performance of students, having an especially strong effect for women.

A number of authors have studied the effects of how female models encourage female students to enter STEM careers. At the middle and high school level, there is evidence that in South Korea, seventh grade students who have had female teachers perform higher on standardized tests than female students with male teachers, up to five years later, as well as being more likely to enter a STEM career (Lim and Meer, 2015). In France, through an experiment exposing an external female role model to 12th graders, Breda et al. (2020) find that these female students increase their odds of enrolling in a STEM (male-dominated) career by 30 percent the following year. Specifically in Chile, Paredes (2014) studied that having a female mathematics teacher in eighth grade increases the average scores on the mathematics SIMCE[5] by approximately 0.04 standard deviations, which is equivalent to almost a quarter of the gender gap in mathematics, and attributes it to a role model effect.

At undergraduate level, Carrell, Page, and West (2010) find that having a female teacher in introductory math and science courses at the US Air Force Academy increases the probability that

[5] SIMCE is a standardized test applied to all 8th graders in the country at the same time, to measure quality of education.

the top female students study STEM majors by 26 percentage points, in compared to having exclusively male teachers. All of this literature agrees with a very important thing: the effect of having a same-sex mentor is especially strong for women, while it is limited for men (West, Carrell & Page, 2010; Paredes, 2020; Sosik & Goldshalk, 2000).

On their part, Porter and Serra (2020) study the effect of exposure to female role models in introductory economics courses for an American university[6]. Alumni of the economics major are selected to carry out a 15-minute intervention in some of the classrooms, selected randomly. The speeches of these women are characterized by being neutral in terms of gender. They explain how choosing an economics degree influenced their job performance and how they became successful. Using a difference-in-differences strategy, they find that visits have a positive and significant effect of 8 percentage points (over a 9% baseline) on female students' decision to major in economics. They conclude that the mechanism is "inspirational" and not informational. This is a simple and low-cost intervention that can encourage women to enter traditionally male-dominated areas, which also coincide with being those with the highest salaries.

3 Context

3.1. Chilean University Admission System

The Chilean admission system to universities is administered by the "Department of Educational Evaluation, Measurement and Registration" (DEMRE, for its initials in Spanish), a body belonging to the University of Chile. 36 universities affiliated to the system –both public and private– participate in this program, selecting their students every year through a standardized test. The University Admission Test (PSU[7], for its initials in Spanish) plus high school grades[8] weight a score with which students fill out a list of 10 applications in order of preference. Although students are uncertain whether or not they will be selected in their preferred program, there is a notion based on the cutoff score from the previous year.

Given this, students choose their career before entering college, when they receive scores from the PSU. Unlike the American system, there is no process during the firsts years of college where they can decide towards which career to go to. University careers in Chile last approximately 5 years, in the fourth year a bachelor's degree is received and a professional "title"[9] is received at the end.

3.2. The Commercial Engineering Career and Economics in Chile

In Chile, economics coexists with other disciplines –particularly with business administration– in a single professional career: Commercial Engineering. Therefore, economics as such is not a professional degree, but rather a specialization within the career, it is a bachelor's degree. This is important to specify because in Chile professional titles seem to be more important than bachelor's degrees, and we don't have a professional title of Economist.

Although these two –business administration and economics– are very different, they have a common academic training in the first two years of the career, and then they begin specialization by choosing one of the two majors[10]. Before choosing one of the two, the common grid of the career at the Adolfo Ibáñez University (UAI), where the data I worked with came from, contains the courses

[6] South Methodist University (SMU)

[7] This test is comparable to the U.S. SATs. The test has been recently replaced for a new version, but this change was after the time of my data.

[8] High school grades avarage.

[9] In addition to the bachelor's degree.

[10] This work is based specifically in the academic curriculum of Universidad Adolfo Ibáñez.

shown in table 1.

Table 1: Commercial Engineering Academic Program.

1	Writting	Introduction to Business	**Introduction to Economcis**	**Calculus I**	**Algebra I**		
2	Verbal Reasoning	Entrepenuership Workshop	Accounting I	**Calculus II**	Macroeconomics I		
3	Political Analysis	Science I	Accounting II	Calculus III	**Microeconomics I**	People and Organizations	Leadership I
4	Logic and Argument Theory	Science II	Microeconomics II	Algebra II	Statistics I	Firm Environment	Oral Expression

At the end of the fourth semester, when –ideally– these courses have been taken, students choose their major. If they choose Economics, in the following semester (the fifth) they enroll in Mathematical Economics, the first subject of the major, of which only the courses that are in bold in table 1 are prerequisites (that is, Introduction to Economics, Microeconomics I, Algebra I, Calculus I and Calculus II). It should be noted that students are not asked at the beginning of the career in which major they are most interested in.

3.3. Teaching Assistants

Teaching assistants are students who are characterized by having an outstanding performance in the subject they teach. They are not experts, but they know the subject matter of the course in depth and must know how to develop the exercises and concepts in a clear and orderly manner, in order to be able to dictate complementary sessions to the course chairs. In addition, they must be available to resolve student inquiries during the semester. They are chosen by the professors, either through the online application system in the case of the Adolfo Ibáñez University, or directly. There are two type of teaching assistants. First, the ones who actually teach, who perform weekly classes, and second, the correction assistants, who correct tests, quizzes and assignments. In general, there are two assistants per course, and in many cases, they share the tasks of doing classes and correcting, in addition to supervising the students when taking tests and exams. Most of the UAI assistants are students from the same university. All of this, in addition to the age proximity between assistants and students, allows the generation of a closer bond with greater probability than with a teacher.

4 Data

For this work I had access to the administrative data of the career of Commercial Engineering, from Adolfo Ibáñez University[11]. The sample is composed only of students from the Peñalolén[12] campus. The specialty of Economics is not available at the Viña del Mar campus, therefore, those who want to specialize must move Santiago city, which implies additional decision variables that I did not consider in this study.

The economics major was offered for the first time in 2011, but the academic program at that time changed for 2013. For this reason, the students in the cohorts that correspond to the old grid are not part of the sample used in this study. The 2019 and 2020 cohorts are also not included as they have not yet completed their first four semesters and therefore have not made their major choice yet. So, the sample is made up of students from the Peñalolén campus, cohorts 2013 to 2018.

[11] All of the data provided by Adolfo Ibañez University is unnamed and do not allow the identification of the students.

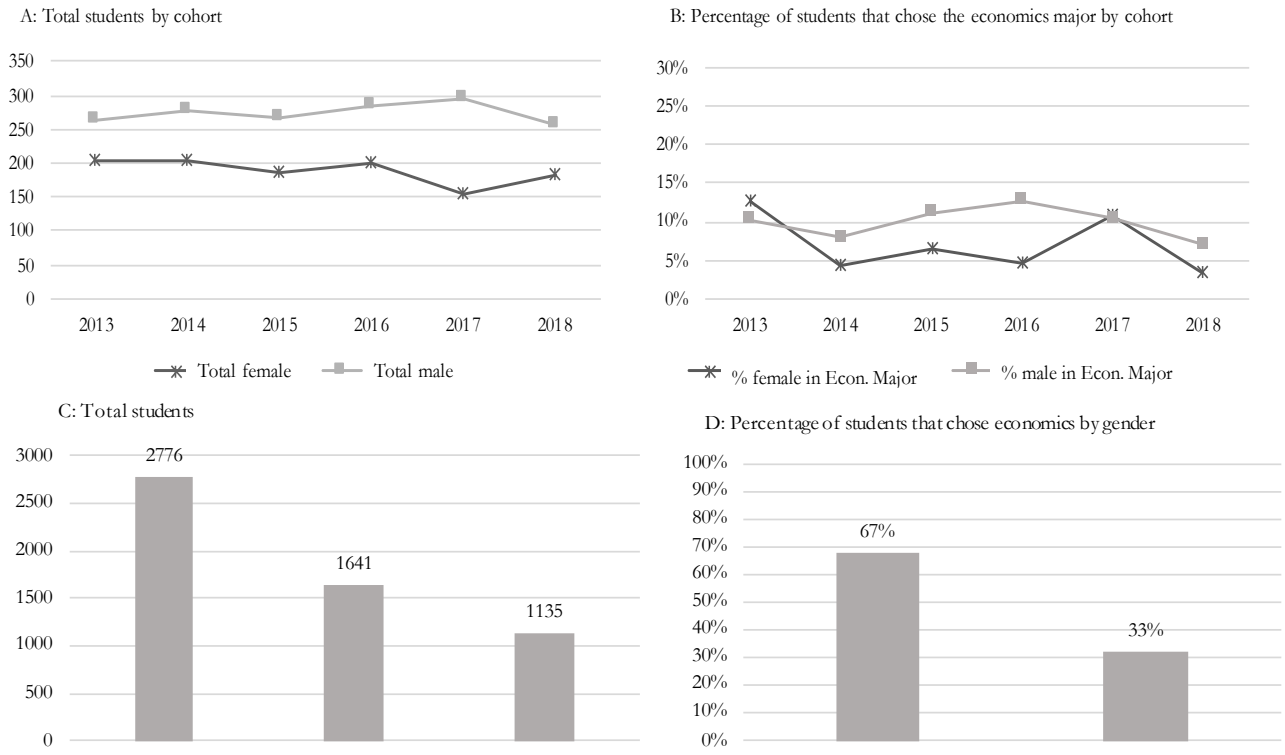
[12] Peñalolén is gemeinde located in Santiago City.

The data correspond to the course enrollment, associated with their respective class number. The decision variable for the major in Economics is the enrollment of the course Mathematical Economics (ECO301). This is the first class of the specialty and by academic progress, it corresponds to the fifth semester. It is dictated only once a year, in the first semester. Given this, the sample was reduced only to those students who have approved the courses that are prerequisites to enroll in Mathematical Economics; that is, to those who are in a position to choose this first course of the Bachelor of Economics. These subjects are shown in table 2. With all this, the sample is made up of 2776 students. Figure 2 shows the evolution of the number of students in the major by cohort and gender.

Table 2: Prerequisite Courses for Mathematical Economics

Nombre Asignatura	**Course ID**	**Semester**
Introduction to Economics	ECO121	1
Microeconomics I	ECO201	3
Calculus I	MAT108	1
Calculus II	MAT118	2
Algebra I	MAT112	1

Figure 2: Students by cohort and by gender



Note: Figure A measures the total of students from Commercial Engineering career, cohorts 2013-2018, that have enrolled and approved Introduction to Economics, Microeconomics I, Calculus I and II and Algebra I. Figure B measures the percentage of these students that have enrolled Mathematical Economics, meaning, that entered the economics major. Figura C shows the total of students and the percentage by gender, and figure D shows the percentage of the students from the economics major by gender

Regarding what is known about the students, I have the PSU score, the ranking score of the high school grades[13], the type of school (public or private), the average of grades accumulated up to the fourth semester, number of failures, and if they entered by special admission[14].

A summary of the general statistics of the sample is presented in Table 3. About 42% are women. Of the total sample, almost 9% enrolled in Mathematical Economics. Given this, it is important to note that I have a small data as very few students choose economics. This can translate into low power to estimate regressions. In relation to the differences between men and women, 6.96% of women enter the major in Economics, while men are 9.99%. Men have a higher average performance in the PSUs, with 690 points in math and 636 points in language, while women obtained 676 and 631 on average, respectively. However, women come with a previous performance superior to that of men. They have, on average, 50.8 points higher than the ranking of high school grades. Considering the grade scale used in Chile, from 1.0 to 7.0, with 4.0 being the minimum grade to pass a course, the accumulated general average up to the fourth semester is 4.8 for women failing 1.8 courses on average and 4.6 for men failing 2.9 courses on average. Most of the students –92.63%– come from a private school and 17.87% entered by special admission, being 21.41% of the total women and 15.42% men.

Table 4 shows the average grades of the students in the prerequisite courses in Mathematical Economics. The observations are separated by the students who enrolled in Mathematical Economics, that is, students of the Bachelor of Economics, and students who have not enrolled in the course. That is, administration students, or students who have not yet chosen (keep in mind that all the students in the sample are in a position to have chosen and some could take Mathematical Economics in later periods, outside the sample used in this study). For the 5 courses, the same rule follows: economics students perform better than business students, and female students perform better than male students.

Tabla 3: Estadísticas Generales

	General			Mujeres			Hombres			
Variable	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	**Obs**	**Mean**	**Std. Dev.**	P Value, mean test
Mathematical Economics	2,776	8.75%	0.283	1,135	6.96%	0.255	1,641	9.99%	0.300	0.0054
PSU Mathematics	2,626	684.1	37.491	1,074	675.8	34.365	1,552	689.8	38.491	0
PSU Spanish	2,626	634.2	58.493	1,074	631.2	58.694	1,552	636.2	58.284	0.0309
Ranking	2,613	667.8	68.535	1,067	697.8	61.627	1,546	647.0	65.340	0
Average	2,776	4.7	0.603	1,135	4.8	0.591	1,641	4.6	0.596	0
Courses Failed	2,776	2.5	2.879	1,135	1.8	2.492	1,641	2.9	3.040	0
Special Admision	2,776	17.87%	0.383	1,135	21.41%	0.410	1,641	15.42%	0.361	0
Private School	2,634	92.63%	0.261	1,067	92.60%	0.262	1,567	92.66%	0.261	0.95
Subsidized School	2,634	5.69%	0.232	1,067	5.81%	0.234	1,567	5.62%	0.230	0.8323
Public School	2,634	1.67%	0.128	1,067	1.59%	0.125	1,567	1.72%	0.130	0.7987

Note: Descriptive statistics of Commercial Engineering students UAI, Peñalolén campus, cohorts 2013-2018, who have entered and approved Introduction to Economics, Calculus I and II, Algebra I and Microeconomics I. Mathematical Economics is a dummy of whether the student took the course or not. The P value corresponds to the t-test between women and men for each variable.

[13] Selection factor that recognizes the effort of students during their school career and benefits those who perform well in their relative context. It expresses the relative position of the student in each educational context in which they were during their High School, taking as a reference the performance of the students in the last three generations of that context.

[14] Special admission is done outside the regular admission system and there are different alternatives such as transferring from another university, athletes, academic excellence, etc. (https://admision.uai.cl/admision/admision-especial/)

Table 4: Average performance of students in prerequisite subjects for Mathematical Economics

	Students who enrolled in Mathematical Economics						Students who did not enrolled in Mathematical Economics					
	Female			**Male**			**Female**			**Male**		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Introduction to Economics	79	5.115	0.650	164	4.988	0.628	1056	4.748	0.600	1477	4.635	0.556
Microeconomics I	79	5.293	0.729	163	4.942	0.793	1027	4.690	0.760	1430	4.381	0.859
Calculus I	79	5.072	0.737	164	5.059	0.743	1056	4.789	0.732	1477	4.648	0.724
Calculus II	79	5.372	0.687	164	5.003	0.764	1052	4.893	0.708	1467	4.639	0.678
Algebra I	79	5.404	0.689	164	5.341	0.737	1056	5.129	0.720	1477	4.896	0.721

Note: The values correspond to the average performance of the students in each subject prerequisite for Mathematical Economics. The first half corresponds to students of the major of Economics, and the second half corresponds to the rest of the sample: students who have not yet registered or students of the major of Business Administration.

Of the teachers, the gender, academic degree, and type of working day (hour or full-time) are known. The total sample was exposed to 53 teachers. 69.81% of these have an hourly shift and 30.19% are staff, these being 14 women and 39 men. Table 5 shows the academic degrees of academic body of the sample.

Table 5: Professors Degree

Grado	**Freq.**	**Percent**
Bachelor	9	20
Professional Title	8	17.78
Master	18	40
PhD	10	22.22
Total	45	100

Nota: Tabla de grados de profsores de la muestra hecha en base a 45 profesores debido a falta de datos. Esto equivale a un 84.9% de los profesores de la muestra.

Regarding the teaching assistants, the sample is made up of 641 assistants; 46.03% women and 53.97% men. I know their gender, if they are major in economics or not –at the time of data collection– and if they are UAI students or external. It is also known whether the assistant is a corrector or an instructor, but as I mentioned earlier, in many cases the assistants share the tasks of being instructors and correctors, so there is no difference between proofreaders and instructors. This is because the system does not allow registering an assistant as a corrector and instructor at the same time. Therefore, my work does not distinguish the type of assistant, because the classification is not precise: an instructor assistant can be classified as a corrector and vice versa.

Figure 4 shows the exposure to female teaching assistants in the prerequisite courses to enroll in Mathematical Economics for all students in the sample, without differentiating by major. It is striking that most of the students had female assistants in the initial economic courses. In contrast, in the initial mathematical courses, most of the students had only male assistants. Then, figure 5 shows the exposure to female assistants of undergraduate economics students. Here I show how female students who are part of the economics major were previously more exposed to female assistants, especially in economic subjects. In Introduction to Economics, 73% of all women had at least one female assistant, while in the case of students of the major of economics this percentage corresponds to 84%. In Microeconomics I, 76% of the students had at least one female assistant. In the major of economics, 89% were exposed to female assistants in this course.

Figure 4: Female assistant exposure, complete sample

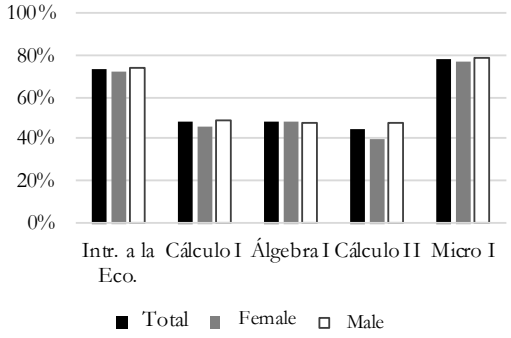
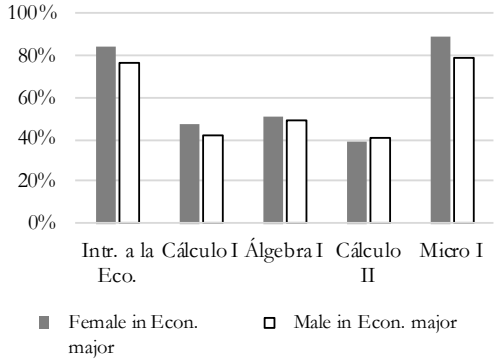


Figure 5: Female assistant exposure, economics major



Note: The percentages in figure 4 represent the students (of the total of the sample) that had at least one female assistant in each course. Percentages in figure 5 represent the students from the economics major that had at least one female assistant in each course.

5 Methodology

5.1. The Model

I used a linear probability model with a difference-in-difference estimation strategy. The treated group consists of those students who were exposed to at least one female assistant[15]. The analysis is divided by course and by area (economics and mathematics[16]), which correspond to the prerequisites to register Mathematical Economics, first specialty course of the Bachelor of Economics. Then, those students who had at least one female assistant in the respective subject/area are treated. Therefore, the control group is the students who for each subject/area had only male assistants. The following regression measures the effect of the role model:

$$Y_i = \beta_0 + \beta_1 T_i + \beta_2 Female_i + \beta_3 T_i * Woman_i + \beta_4 X_i + \varepsilon_i$$

Y_i is the proxy for student i interest in economics and is equal to 1 if student i enrolled in Mathematical Economics and 0 if not, during the sample period. T_i is a treatment dummy, that is, it is equal to 1 if student i had at least one female teaching assistant in the corresponding course/area and 0 if he had only male assistants. For its part, $Female_i$ is equal to 1 if student i is a woman, and 0 for male students. The interaction coefficient between these two dummies, β_3, is the coefficient of interest, as it indicates whether having a female assistant affects female students differently than male students in their decision to pursue a degree in Economics. X_i, a vector of control variables per student and section, is also included.

This regression was estimated for the baseline case of treated and controls already described, and another one in which the intensity of treatment is studied: students who had 2 or more female assistants in each course/area are treated, and controls who had less than 2 female assistants in each course/area. Since most classes have 2 assistants, this model would indicate the effect of having only female assistants in each course.

5.2. Identification Strategy

[15] Balance tests tables of the treated and control groups for each course are found in the appendix.
[16] Economics: Introduction to Economics and Microeconomics I. Mathematics: Calculus I, Calculus II and Algebra I.

The model's identification strategy is based on the exogeneity of the assignment of assistants: students do not have the power to choose them, at least not directly. Moreover, the selection process of the assistants is after the course enrollment. In this process, the first step is the creation of the teaching assistance offer by each teacher, this takes place the last week of July (for the second semester), once the first course enrollment chance is finished. Then the assistants apply, in the last days of July. Finally, the results are published. After that those teachers who want to work with specific assistants who have not created an online offer, have the opportunity to make direct registrations in the system. As an example, Table 6 shows the academic calendar of these periods for the years 2016 and 2017. However, what is not random is the enrollment of courses and, therefore, the choice of teachers. From the second semester onwards, students choose their teachers, based either on schedules, teacher reputation, groups of friends, types of assessments, etc.[17] We know that teachers do not randomly choose their assistants, in many cases they meet them, interview them and choose them specifically. Therefore, if this selection on the part of the teachers had a gender bias, the students when choosing the teacher would be indirectly choosing the gender of the assistant with greater probability.

Table 6: Academic calendar period of course enrollment and assistants selection, 2016 and 2017

2016

1	29-feb	01-mar	02-mar	03-mar	04-mar
	1st enrollment			Assistants Selection	
				2nd enrollment	
2	25-jul	26-jul	27-jul	28-jul	29-jul
		1st enrollment		Assistants Selection	
					2nd enrollment

2017

1	27-feb	28-feb	01-mar	02-mar	03-mar
	1st enrollment			Assistants Selection	
				2nd enrollment	
2	24-jul	25-jul	26-jul	27-jul	28-jul
		1st enrollment		Assistants Selection	
					2nd enrollment

Note: This table shows the academic calendar period that corresponds to the enrollment of courses and selection of assistants, for the years 2016 and 2017. The rest of the years follow the same logic. The numbers 1 and 2 to the left of each diagram correspond to the semester.

Table 7 shows a characterization of the assistants according to the variables that are observable for the students when choosing teachers and that are relevant to the study. The observations correspond to the number of assistants in the sample of the original model. The gender of the teacher is relevant because I want to make sure that I am capturing the role model effect of the assistant and not of the teacher, when she is a female. A professor with a PhD could be a more experienced and reputable professor. The full-time type of shift could represent many things; better schedule, more availability within the university –for having an office–, being better known, etc. That the assistant is part of the major in economics could indicate the level of demand of the teacher. There could be economics professors who have a bias towards students from the economics major. While the latter is not an obvious endogeneity mechanism, I want to make sure that it is not problematic. The point in all these cases is that, if according to any of these characteristics the teachers prefer female assistants than males, the students by preferring them indirectly choose to be in courses with female assistants with higher probability.

[17] I published a survey in the Students UAI Facebook group, for Commercial Engineering students. I asked them to think about how they chose their courses in first and second year. I got 187 responses. Although it is not a representative sample, it gave me insight into what are the things that students look at when choosing their teachers. They were asked to mark the options they considered the most, and the ones that were repeated the most are: schedule (91.4%), teacher reputation (92.4%), friends (58.4%) and evaluations (38.4%).

Table 7: Characterization of assistants in prerequisite courses for admission to the economics major

	Total			**Female Assistants**			**Male Assistants**			
Variable	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	P Value, t-test
Female Teacher	641	29.2%	0.455	296	23.7%	0.426	345	33.9%	0.474	0.004
PhD	641	20.6%	0.405	296	16.9%	0.375	345	23.8%	0.426	0.032
Full-Time	641	41.3%	0.493	296	48.3%	0.501	345	35.4%	0.479	0.001
Economics Assistant	630	33.8%	0.473	295	32.5%	0.469	335	34.9%	0.477	0.529
Average Performance	613	4.30	0.930	285	4.29	0.944	328	4.31	0.919	0.873

Note: The observations correspond to assistants of Introduction to Economics, Microeconomics I, Calculus I and II and Algebra I. It should be noted that there may be more than 1 assistant per course. The first set of columns corresponds to the percentage of the total assistants in the sample that was associated with each variable. It can be read as follows: 29.2% of all assistants were an assistant to a female teacher, 20.6% were assistant to a teacher with a PhD, etc. Economics assistant corresponds to the assistants part of the major, and the average performance is from the class. The second and third part of the table correspond to the total of the assistants filtered by gender and the P value corresponds to the t-test of these two groups.

The observations are divided by gender, and the P value corresponds to the t-test of difference of means. We see a gender bias in the variable female teacher. That is, female teachers tend to choose more male assistants, suggesting a source of non-randomness. However, if the bias were to choose more female assistants, having a female assistant could be a proxy for a female teacher, and the role model effect could be given by the teacher's gender, and not that of the assistant. Therefore, as the bias goes in the opposite direction, the final estimate tends to obtain an attenuated effect of the impact of the role model of female helpers.

Therefore, there is also a gender bias in the choice of assistant by the full-time teachers: they choose more female assistants than males. In this case, a student who chooses a full-time teacher for over a part-time one would be indirectly choosing a female assistant. The same happens with professors with PhDs. Given the possibility that this induces a selection bias in my estimates, below, I explored in more detail the choice of assistants by teachers to identify where these differences come from.

My set of subjects includes two areas: economics and mathematics. According to my data, the professors in each area may have taught more than one course in their area, but not one in the other area. Also, since they are professionals from different disciplines, there could be a significant difference in how math versus economics teachers choose. So, I ran the analysis again, but this time divided by area, as it gives me a clearer idea of where the effects of the table representing the entire sample come from. Tables 8 and 9 show the characterization of the assitants divided by area. The first panel shows the complete area, then there is the detail by course.

Differentiating by area, there is still a gender bias coming from the female teachers. In the same way, in both areas there is bias coming from the full-time teachers. For economics, the bias of female teachers comes from Microeconomics I. But as I mentioned earlier, they choose more male assistants than female, so the final estimate of the impact of female assistants as role model tends to come from an effect attenuated by this bias. With regard to the bias of the full-time teachers, it comes from the Introduction to Economics course. Being a first semester course, students do not choose their teachers, unless they are repeating the course. For this reason, even when there is a gender bias on the part of the regular teachers, these sections were given to the students when they entered the first semester of the career. The same happens for mathematical courses, the bias of the full-time teachers is given by Calculus I, which is also a first-semester course. Something similar happens with the bias

on the part of professors with a PhD in Introduction to Economics, Calculus I and Algebra I, all of them from the first semester.

In the case of assistants of the economics major, there is bias in both areas, but in opposite directions. In the economic area, the professors who decide to choose economics students choose more men than women, and in the mathematical area, they choose more women than men. It should be remembered that it is not known if the assistant was already enrolled in the economics degree at the time of being an assistant. This might be thought to be an important variable, as more demanding or more reputable teachers might prefer to choose economics assistants for these fields. In that case, a student who chooses a more demanding teacher would be indirectly choosing the gender of her assistant. Even so, since the variable does not necessarily indicate whether the assistant had already entered the major when the professor chose her, it does not fully represent the criteria of a professor who specifically decides to choose assistants from the economics major.

Ultimately, my identification strategy has weaknesses, therefore, the results must be read carefully. There are several cases where I find gender biases on the part of the teachers, selected under observable characteristics for the students when choosing. The important thing is that by making the division I managed to clarify a significant difference that could be important for the econometric results of the economic area: the gender bias of the full-time teachers. However, several of these subjects –Introduction to Economics, Calculus I and Algebra I– are in the first semester, so for most students, they are courses that they do not choose. This reinforces the main results of the model, which are in economic subjects and not in mathematics.

Table 8: Characterization of assistants, economic area

Economic Area	**Total**			**Female Assistants**			**Male Assistants**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Valor P, test de medias
Female Teacher	336	18.8%	0.391	157	13.4%	0.341	179	23.5%	0.425	0.018
PhD	336	24.7%	0.432	157	21.0%	0.409	179	27.9%	0.450	0.144
Full-Time	336	43.8%	0.497	157	50.3%	0.502	179	38.0%	0.487	0.023
Economics Assistant	330	48.2%	0.500	157	41.4%	0.494	173	54.3%	0.500	0.019
Average Performance	323	4.157	1.074	153	4.184	1.039	170	4.134	1.107	0.676
Introduction to Economics										
Female Teacher	173	4.62%	0.211	83	2.41%	0.154	90	6.67%	0.251	0.185
PhD	173	38.73%	0.489	83	31.33%	0.467	90	45.56%	0.501	0.055
Full-Time	173	55.49%	0.498	83	62.65%	0.487	90	48.89%	0.503	0.070
Economics Assistant	168	39.88%	0.491	83	33.73%	0.476	85	45.88%	0.501	0.109
Average Performance	169	4.402	0.632	81	4.391	0.672	88	4.412	0.597	0.831
Microeconomics I										
Female Teacher	163	33.74%	0.474	74	25.68%	0.440	89	40.45%	0.494	0.047
PhD	163	15.95%	0.367	74	13.51%	0.344	89	17.98%	0.386	0.442
Full-Time	163	31.29%	0.465	74	36.49%	0.485	89	26.97%	0.446	0.194
Economics Assistant	162	56.79%	0.497	74	50.00%	0.503	88	62.50%	0.487	0.111
Average Performance	154	3.889	1.360	72	3.951	1.304	82	3.835	1.414	0.600

Note: The observations of the first panel correspond to assistants of Introduction to Economics and Microeconomics I. Then, they are detailed by course. It should be noted that there may be more than 1 assistant per course. The first set of columns corresponds to the percentage of the total assistants in the sample that was associated with each variable. It can be read as follows: 21% of all assistants were an assistant to a female teacher, 34.9% were assistant to a teacher with a PhD, etc. Economics assistant corresponds to the assistants part of the major , and the average performance is that of the class. The second and third parts of the table correspond to the total of the assistants filtered by gender, and the P value corresponds to the t-test of these two groups.

Table 9: Characterization assistants, mathematical area

Variable	**Total**			**Female Assistants**			**Male Assistants**			
Mathematic Area	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	P Value, t-test
Female Teacher	305	40.7%	0.492	139	35.3%	0.479	166	45.2%	0.499	0.079
PhD	305	12.5%	0.331	139	9.4%	0.292	166	15.1%	0.359	0.134
Full-Time	305	38.7%	0.488	139	46.0%	0.500	166	32.5%	0.470	0.016
Economics Assistant	300	18.0%	0.385	138	22.5%	0.419	162	14.2%	0.350	0.064
Average Performance	290	4.460	0.705	132	4.422	0.804	158	4.492	0.610	0.401
Calculus I										
Female Teacher	111	34.23%	0.477	52	28.85%	0.457	59	38.98%	0.492	0.265
PhD	111	13.51%	0.343	52	13.46%	0.345	59	13.56%	0.345	0.988
Full-Time	111	39.64%	0.491	52	48.08%	0.505	59	32.20%	0.471	0.090
Economics Assistant	110	16.36%	0.372	52	21.15%	0.412	58	12.07%	0.329	0.202
Average Performance	107	4.351	0.582	51	4.380	0.697	56	4.324	0.459	0.618
Algebra I										
Female Teacher	102	37.25%	0.486	45	33.33%	0.477	57	40.35%	0.495	0.472
PhD	102	13.73%	0.346	45	6.67%	0.252	57	19.30%	0.398	0.067
Full-Time	102	33.33%	0.474	45	40.00%	0.495	57	28.07%	0.453	0.208
Economics Assistant	98	14.29%	0.352	44	18.18%	0.390	54	11.11%	0.317	0.208
Average Performance	102	4.615	0.687	45	4.667	0.534	57	4.573	0.790	0.497
Calculus II										
Female Teacher	92	52,17%	0,502	42	45,24%	0,504	50	58,00%	0,499	0,227
PhD	92	10,87%	0,313	42	9,52%	0,297	50	12,00%	0,328	0,708
Full-Time	92	43,48%	0,498	42	50,00%	0,506	50	38,00%	0,490	0,252
Economics Assistant	92	23,91%	0,429	42	28,57%	0,457	50	20,00%	0,404	0,343
Average Performance	81	4,411	0,836	36	4,176	1,108	45	4,599	0,462	0,023

6 Results

I used a linear probability model to estimate the effect of the treatment. Table 10 presents the results of the regression analysis, which allowed me to examine the role model effects of the natural experiment in question through a difference-in-difference strategy, as I explained in the previous section. Each column represents the model with the respective treated for each course and area. The dependent variable in all regressions is the same: a Mathematical Economics enrollment dummy, which represents the choice of the Bachelor of Economics. The interaction coefficient (T * Female) allowed me to examine the effects of the role model on female students. For all specifications, standard errors are presented in parentheses.

There is evidence that there is an impact of female economics course assistants on their female students for the choice of Mathematical Economics. All interaction coefficients are positive, but only the largest ones are significant. In Microeconomics I (column 2, table 10), I obtained a positive and significant difference-in-differences coefficient. Having at least one female assistant in this course increases the chances of female students –before those of men– of choosing the major of economics by 4.5 percentage points. This is also significant when we speak of having had at least one female assistant in the economic area (Introduction to Economics and Microeconomics I), with an effect of 6.6 percentage points more. It should be noted that because the base percentage of female students entering the economics major is quite low (6.96%), the effect is quite large.

Table 10: Base model results

	(1) Introduction to Economics	(2) Microeconomics I	(3) Calculus I	(4) Calculus II	(5) Algebra I	(6) Mathematic Area	(7) Economic Area
Female	-0.050***	-0.065***	-0.046***	-0.041***	-0.031**	-0.092**	-0.038
	(0.018)	(0.019)	(0.015)	(0.015)	(0.014)	(0.037)	(0.026)
T	0.011	0.002	-0.030**	-0.026*	0.006	-0.008	-0.024
	(0.017)	(0.018)	(0.015)	(0.015)	(0.015)	(0.035)	(0.020)
T * Female	**0.028**	**0.045****	**0.031**	**0.023**	**0.001**	**0.066***	**0.009**
	(0.022)	(0.023)	(0.021)	(0.021)	(0.021)	(0.038)	(0.028)
Controls	No	No	No	No	No	No	No
_cons	0.092***	0.099***	0.115***	0.112***	0.097***	0.107***	0.120***
	(0.014)	(0.016)	(0.011)	(0.011)	(0.010)	(0.034)	(0.019)
Obs.	2776	2776	2776	2776	2776	2776	2776
R-squared	0.004	0.005	0.004	0.004	0.003	0.004	0.004

Standard errors in parentheses *** *p<0.01,* ** *p<0.05,* * *p<0.1*

Note: Linear probability model regressions. Female is a female student dummy variable, T is a treatment dummy variable (having at least one female assistant in the respective course/area). The name of each column indicates the composition of the treated and control groups for each variable. The dependent variable in all of them is the same: a dummy variable equal to 1 if the student enrolled in Mathematical Economics and 0 if not.

Then I introduced several control variables. Regarding the teachers, –based on the exploration of the identification strategy– a dummy variable of a female teacher and a dummy variable of full-time teacher, given that these seemed to be the most problematic variables in terms of gender bias of the teachers. For students, the average performance of the class and the average performance of the student on the five prerequisite courses for Mathematical Economics. It is important to note that the sample is small, that is, there is little data. Since this creates a lack of power when estimating the regressions, I limited the analysis only to the controls just mentioned, adding them little by little and omitting the rest of the information that is known about the sample.

In Tables 11, 12 and 13 I present the results of the regressions with controls. In table 11 the model with control of female teacher and academic class performance in panel A, and of female teacher and student academic performance in panel B. In table 12, the results of the model with control of full-time teacher and performance of the class in panel A, and full-time teacher and student performance in panel B. Finally, table 13 shows the results with controls for female teacher and full-time teacher in panel A, and class academic performance and the student performance in panel B.

For the most part, the result of the original model is maintained without controls, showing the robustness of the results to the inclusion of these variables. It should be noted that adding the female teacher control does not change the result, which could have been worrisome given that I am trying to measure the effect of female assistants and not female teachers. The only control variable that causes my coefficients of interest to lose significance is the student's average performance in the prerequisite courses. Although the magnitudes of the coefficients are smaller, in panel B of table 11 the coefficient of differences-in-differences in the economic area is marginally insignificant (P = 0.116) and in table 12, panel B, both that of Microeconomics I and economic area are also (P = 0.11 and P = 0.114 respectively). It seems important to highlight this, since the result of Microeconomics I when adding this control is quite robust.

Table 14 shows the results of the estimates in which the treated are those students who had more than one female assistant in each case[18]. Although I found a positive and significant effect for the coefficient of the economic area, this is of a lesser magnitude than that of the original model. This might suggest that the mechanism of the role model effect is sheer exposure to the teaching assistant, and not the number of assistants exposed to. For the rest of the subjects, I did not see any effect under this specification.

[18] I also studied the case in which the treated are those students who had at least one female assistant who belongs to the economics major, for each subject and area. I find no significant effects for this specification, and the magnitude is vastly less. This could be explained because the variable is not capturing the expected effect. An assistant classified as part of the economics degree (currently) may not have been in the degree at the time of the assistantship. Although the variable may represent some interest in the area on the part of the assistant, the effect is not direct. This is because the student could not identify with "if she can, me too" if she has not yet entered the major. As the courses analyzed are in the first and second years (first semester), the assistants can perfectly do the assistantship the semester after passing the field and by then have not yet reached the point of choosing a major. For lack of power, this case does not seem to be interesting. The table with the results of this specification is in table 10 of the appendix.

Table 11: Base model with controls for female teacher and academic performance

11A: Controls female teacher and average performance of the class

	(1) Introduction to Economics	(2) Microeconomics I	(3) Calculus I	(4) Calculus II	(5) Algebra I	(6) Economic Area	(7) Mathematic Area
Female	-0.050***	-0.075***	-0.046***	-0.044***	-0.031**	-0.097***	-0.039
	(0.018)	(0.021)	(0.015)	(0.015)	(0.014)	(0.036)	(0.026)
T	0.011	-0.013	-0.029*	-0.020	0.007	-0.017	-0.019
	(0.017)	(0.019)	(0.015)	(0.015)	(0.015)	(0.035)	(0.021)
T * Female	**0.028**	**0.046***	**0.032**	**0.021**	**0.003**	**0.063***	**0.008**
	(0.022)	(0.024)	(0.021)	(0.021)	(0.021)	(0.038)	(0.028)
Controls	Fem. Teacher + class performance	Fem. Teacher + class performance	Fem. teacher + class performance	Fem. teacher + class performance	Fem. teacher + class performance	Fem. teacher + class performance	Fem. teacher + class performance
_cons	0.026	-0.073*	0.207***	-0.025	0.024	-0.235***	-0.120
	(0.087)	(0.043)	(0.070)	(0.064)	(0.078)	(0.079)	(0.098)
Obs.	2776	2699	2776	2762	2776	2776	2776
R-squared	0.006	0.017	0.005	0.006	0.005	0.018	0.007

11B: Female teacher controls and average student performance

Female	-0.075***	-0.078***	-0.067***	-0.060***	-0.055***	-0.108***	-0.060**
	(0.018)	(0.019)	(0.015)	(0.015)	(0.014)	(0.036)	(0.026)
T	0.013	-0.007	-0.019	0.004	0.015	-0.005	0.000
	(0.016)	(0.018)	(0.014)	(0.014)	(0.014)	(0.032)	(0.020)
T * Female	**0.030**	**0.033**	**0.029**	**0.017**	**0.004**	**0.058**	**0.009**
	(0.022)	(0.022)	(0.021)	(0.021)	(0.021)	(0.037)	(0.028)
Controls	Fem. Teacher + student performance	Fem. Teacher + student performance	Fem. Teacher + student performance	Fem. Teacher + student performance	Fem. Teacher + student performance	Fem. Teacher + student performance	Fem. Teacher + student performance
_cons	-0.407***	-0.370***	-0.388***	-0.412***	-0.414***	-0.387***	-0.431***
	(0.046)	(0.047)	(0.046)	(0.047)	(0.045)	(0.052)	(0.051)
Obs.	2776	2776	2776	2776	2776	2776	2776
R-squared	0.056	0.055	0.055	0.055	0.056	0.055	0.056

Standard errors are in parentheses. *** *p<0.01, ** p<0.05, * p<0.1*

Note: Linear probability model regressions. Female is a female student dummy variable, T is a treatment dummy variable (having at least one female assistant in the respective course / area). The name of each column indicates the composition of the treated and control groups for each variable. The dependent variable in all of them is the same: a dummy variable equal to 1 if the student enrolled in Mathematical Economics and 0 if not. The top half includes controls: female teacher dummy and average seection performance in the course. The second half includes controls: female teacher dummy and average student performance in the prerequisite courses.

Table 12: Base model with controls for full professor and academic performance

12A: Full-Time teacher control and average performance of the section

	(1) Introduction to Economics	(2) Microeconomics I	(3) Calculus I	(4) Calculus II	(5) Algebra I	(6) Economic Area	(7) Mathematic Area
Female	-0.050***	-0.080***	-0.046***	-0.045***	-0.030**	-0.097***	-0.040
	(0.018)	(0.021)	(0.015)	(0.015)	(0.014)	(0.037)	(0.026)
T	0.012	-0.004	-0.031**	-0.023	0.001	-0.010	-0.023
	(0.017)	(0.019)	(0.015)	(0.015)	(0.015)	(0.035)	(0.021)
T * Female	**0.027**	**0.051****	**0.032**	**0.021**	**-0.000**	**0.062**	**0.009**
	(0.022)	(0.024)	(0.021)	(0.021)	(0.021)	(0.039)	(0.028)
Controls	Full-Time+ class performance	Full-Time+ class performance	Full-Time+ class performance	Full-Time+ class performance	Full-Time+ class performance	Full-Time+ class performance	Full-Time+ class performance
_cons	0.047	-0.116***	0.201***	-0.030	0.031	-0.280***	-0.114
	(0.089)	(0.042)	(0.070)	(0.064)	(0.078)	(0.078)	(0.097)
Obs.	2776	2699	2776	2762	2776	2776	2776
R-squared	0.005	0.015	0.005	0.007	0.005	0.018	0.007

12B: Full-time teacher control and student average performance

Female	-0.074***	-0.081***	-0.067***	-0.060***	-0.054***	-0.108***	-0.061**
	(0.018)	(0.019)	(0.015)	(0.015)	(0.014)	(0.036)	(0.026)
T	0.014	-0.002	-0.023	0.002	0.002	-0.005	-0.005
	(0.016)	(0.017)	(0.015)	(0.015)	(0.015)	(0.033)	(0.020)
T * Female	**0.029**	**0.036**	**0.029**	**0.017**	**0.017**	**0.059**	**0.010**
	(0.022)	(0.022)	(0.021)	(0.021)	(0.021)	(0.037)	(0.028)
Controls	Full-time + student performance	Full-time + student performance	Full-time + student performance	Full-time + student performance	Full-time + student performance	Full-time + student performance	Full-time + student performance
_cons	-0.397***	-0.395***	-0.387***	-0.403***	-0.419***	-0.387***	-0.406***
	(0.046)	(0.045)	(0.045)	(0.047)	(0.046)	(0.052)	(0.051)
Obs.	2776	2776	2776	2776	2776	2776	2776
R-squared	0.057	0.056	0.055	0.054	0.058	0.055	0.055

Standard error in parentheses. *** *p<0.01, ** p<0.05, * p<0.1*

Note: Linear probability model regressions. Female is a female student dummy variable, T is a treatment dummy variable (having at least one female assistant in the respective course / area). The name of each column indicates the composition of the treated and control groups for each variable. The dependent variable in all of them is the same: a dummy variable equal to 1 if the student enrolled in Mathematical Economics and 0 if not. The first half includes controls: plant teacher dummy and average performance of the seection in the course. The second half includes controls: full professor and average performance of students in prerequisite courses.

Table 13: Original model with teacher and performance controls

13A: Full-Time teacher and female teacher controls

	(1) Introduction to Economics	(2) Microeconomics I	(3) Calculus I	(4) Calculus II	(5) Algebra I	(6) Economic Area	(7) Mathematic Area
Female	-0.049***	-0.062***	-0.046***	-0.042***	-0.030**	-0.092**	-0.038
	(0.018)	(0.019)	(0.015)	(0.015)	(0.014)	(0.037)	(0.026)
T	0.011	-0.010	-0.032**	-0.031**	0.003	-0.022	-0.025
	(0.016)	(0.018)	(0.015)	(0.015)	(0.015)	(0.035)	(0.021)
T * Female	**0.026**	**0.040***	**0.031**	**0.023**	**0.001**	**0.066***	**0.010**
	(0.022)	(0.023)	(0.021)	(0.021)	(0.021)	(0.038)	(0.028)
Controls	Full-time + Fem. Teacher	Full-time + Fem. Teacher	Full-time + Fem. Teacher	Full-time + Fem. Teacher	Full-time + Fem. Teacher	Full-time + Fem. Teacher	Full-time + Fem. Teacher
_cons	0.103***	0.117***	0.111***	0.108***	0.085***	0.153***	0.092***
	(0.016)	(0.018)	(0.013)	(0.012)	(0.011)	(0.036)	(0.022)
Obs.	2776	2776	2776	2776	2776	2776	2776
R-squared	0.006	0.009	0.005	0.005	0.006	0.010	0.005

13B: Controls of average performance of the class and average performance of the student

Female	-0.075***	-0.079***	-0.069***	-0.059***	-0.055***	-0.108***	-0.062**
	(0.018)	(0.021)	(0.015)	(0.015)	(0.014)	(0.035)	(0.025)
T	0.013	0.000	-0.019	-0.001	0.015	0.000	-0.006
	(0.016)	(0.018)	(0.014)	(0.015)	(0.014)	(0.032)	(0.020)
T * Female	0.030	0.034	0.031	0.018	0.002	0.058	0.012
	(0.022)	(0.024)	(0.021)	(0.021)	(0.021)	(0.037)	(0.028)
Controls	Performance (class + student)	Performance (class + student)	Performance (class + student)	Performance (class + student)	Performance (class + student)	Performance (class + student)	Performance (class + student)
_cons	-0.332***	-0.373**	-0.182**	-0.286***	-0.330***	-0.356***	-0.081
	(0.090)	(0.052)	(0.074)	(0.066)	(0.082)	(0.051)	(0.092)
Obs.	2776	2699	2776	2762	2776	2771	2776
R-squared	0.056	0.055	0.059	0.056	0.055	0.057	0.059

Standard error in parentheses. *** *p<0.01, ** p<0.05, * p<0.1*

Note: Linear probability model regressions. Female is a female student dummy variable, T is a treatment dummy variable (having at least one female assistant in the respective course / area). The name of each column indicates the composition of the treated and control groups for each variable. The dependent variable in all of them is the same: a dummy variable equal to 1 if the student enrolled in Mathematical Economics and 0 if not. The top half includes controls: a flat teacher's dummy and a female teacher's dummy. The second half includes performance controls: average performance of the class and average performance of students in prerequisite courses

Table 14: Treatment intensity model results: having more than one female assistant

	(1) Introduction to Economics	(2) Microeconomics I	(3) Calculus I	(4) Calculus II	(5) Algebra I	(6) Economic Area	(7) Mathematic Area
Female	-0.038***	-0.037***	-0.034***	-0.035***	-0.031***	-0.074***	-0.042***
	(0.013)	(0.014)	(0.011)	(0.011)	(0.012)	(0.019)	(0.016)
T	-0.033**	-0.037**	-0.045	-0.086***	-0.029	-0.013	-0.018
	(0.017)	(0.016)	(0.036)	(0.024)	(0.032)	(0.018)	(0.016)
T * Female	**0.012**	**0.009**	**0.004**	**0.012**	**-0.048**	**0.059****	**0.018**
	(0.024)	(0.024)	(0.049)	(0.025)	(0.033)	(0.024)	(0.022)
Controls	No	No	No	No	No	No	No
_cons	0.115***	0.117***	0.108***	0.109***	0.108***	0.116***	0.115***
	(0.010)	(0.010)	(0.008)	(0.008)	(0.008)	(0.016)	(0.012)
Obs.	2592	2592	2592	2592	2592	2592	2592
R-squared	0.005	0.006	0.004	0.005	0.005	0.006	0.004

Standard error in parentheses. *** *p<0.01, ** p<0.05, * p<0.1*

Note: Linear probability model regressions. Female is a female student dummy variable, T is a treatment dummy variable (having two or more female assistants in the respective course / area). The name of each column indicates the composition of the treated and control groups for each variable. The dependent variable in all of them is the same: a dummy variable equal to 1 if the student enrolled in Mathematical Economics and 0 if not.

7 Robustness check

7.1. Course set extension

The initial sample was reduced to the students who fulfilled the courses that are prerequisites to enroll in Mathematical Economics. In the timeline, there are in total four economic courses that go before Mathematical Economics. Although Macroeconomics I and Microeconomics II[19] are not prerequisites, a large proportion of students reach the point of choosing the major (either economics or business administration) with these courses completed, and therefore, with additional opportunities to be exposed to assistants of different genders.

This time, I considered all the students who, in addition to having passed the prerequisites[20], enrolled Macroeconomics I and Microeconomics II, without necessarily having passed them. This as long as it was before enrolling in Mathematical Economics or Marketing I, to ensure that I did not take students in whom the exposure to the assistants was after the choice of major. Marketing I is the first course of the major of business administration and fulfills a role similar to Mathematical Economics in the major of economics. It has no prerequisites

Analyzing the effect of these courses could say if it is relevant that the exposure to the role model is closer to the moment of the decision or not, since the results of the base model suggest that there is an effect in Microeconomics I, which is not precisely in the moment of decision. On the other hand, Microeconomics II, due to academic progress, corresponds to the fourth semester and the choice of the degree is in this same semester, around the month of October. The following table shows the results of the regressions for the new subjects. For all specifications, the coefficients for Macroeconomics I and Microeconomics II are negative, but only for the latter they are significant. In other words, having a female assistant in Microeconomics II has a negative effect on female students.

[19] Macroeconomics I belongs to the second semester and Microeconomics II to the fourth semester.

[20] Introduction to Economics, Calculus I and II, Algebra I, Microeconomics I. In this case we are going to omit the specification of the "economic area" since, if we add the economic subjects within a group, 99.43% of the students had at least one female assistant.

This tells us that the temporal proximity between the exposure to the assistant and the choice of degree does not accentuate the modeling effect of the assistants, rather it diminishes it.

Another explanation for the negative effect in the Microeconomics II course versus the positive effect in Microeconomics I may have to do with the contents of both courses. While the contents of Microeconomics I have to do with economic models of supply and demand, exchange, firm theory, etc., Microeconomics II mainly looks at game theory and subjects that can be much more similar to strategy and management. Given this, the content of this course could be encouraging students to move towards the major of business and administration rather than to economics. Therefore, and following the literature, the role model must be in an area directly related to the area of interest, in this case; Microeconomics I.

Table 15: Extension of the model: Macroeconomics I and Microeconomics II

	(1) Macro. I	(2) Macro. I	(3) Macro. I	(4) Micro. II	(5) Micro. II	(6) Micro. II
Female	-0.023	-0.029*	-0.029*	0.011	0.014	0.009
	(0.016)	(0.016)	(0.016)	(0.025)	(0.030)	(0.029)
T	0.012	0.014	0.018	0.044**	0.050**	0.048**
	(0.016)	(0.016)	(0.016)	(0.017)	(0.019)	(0.019)
T * Female	**-0.029**	**-0.026**	**-0.024**	**-0.061****	**-0.064***	**-0.061***
	(0.023)	(0.023)	(0.023)	(0.029)	(0.033)	(0.032)
Controls	No	Fem. Teacher + class performance	Full-time + class performance	No	Fem. Teacher + class performance.	Full-time + class performance
_cons	0.104***	-0.038	-0.091	0.076***	-0.005	-0.046**
	(0.011)	(0.076)	(0.071)	(0.014)	(0.024)	(0.023)
Obs.	2511	2510	2510	2511	2218	2218
R-squared	0.004	0.009	0.008	0.006	0.015	0.019

Standard error in parentheses. **** p<0.01, ** p<0.05, * p<0.1*

Note: Linear probability model regressions. Female is a female student dummy variable, T is a treatment dummy variable (having at least one female assistant in the respective course / area). The name of each column indicates the composition of the treated and control groups for each variable. The dependent variable in all of them is the same: a dummy variable equal to 1 if the student enrolled in Mathematical Economics and 0 if not. Columns (1) and (4) do not contain controls. Columns (2) and (5) controls: dummy of female teacher and average performance of the section. Columns (3) and (6) controls: full-time teacher dummy and average performance of the class.

7.2. Falsification

As a second robustness check, I performed the analysis again, but including subjects that are not a requirement to enter the economics track but that are part of the common plan. For this, I chose the following courses: Introduction to Business, Entrepreneurship Workshop and Accounting I[21]. The objective is to analyze whether the role model effect of female assistants is only in courses related to the area of study. That is to say, I want to show that it is the economics assistants that encourage the students to choose the economics major, and not the administration or other courses. If so, it is expected not to find any effect under this specification. It should be noted that of these three courses, only Introduction to Business is the first semester –and therefore given to students–, while in Entrepreneurship and Accounting I students choose their teachers. The same analysis that I did for

[21] Semesters 1, 2 and 2 respectively. We eliminated from the sample those who took these courses after Mathematical Economics and those who have not yet enrolled in Marketing I or Mathematical Economics (since they have not yet chosen the specialty).

the relevant courses of the base model I did for these three[22]. For Introduction to Business, there is a gender bias in the choice of assistants by the full-time teachers, but as I just mentioned, the students do not choose this course. For the Entrepreneurship Workshop, it appears that female teachers are biased to choose more male assistants, but only 5.8% of the assistants were from a female teacher. Then for Accounting I, the PhD professors have a gender bias towards male assistants. With all this, as for the base model, it must be considered that there is a risk of selection bias due to the lack of power of the data. This is why the results have to be analyzed carefully. Then, the treated group is redefined as those students who had at least one woman in each of these courses and the dependent variable is the same: whether they took Mathematical Economics or not. Table 16 shows the results of the regressions of the business administration subjects. In no case is the coefficient of interaction –which is the coefficient of differences in differences– is positive, neither significant.

Table 16: Original model results with business administration courses.

	(1) Introduction to Business	(2) Entrepenuership Workshop	(3) Accounting I
Female	-0.008	-0.020	-0.035
	(0.035)	(0.034)	(0.038)
T	0.033	0.018	-0.005
	(0.028)	(0.027)	(0.028)
T * Female	**-0.035**	**-0.022**	**-0.005**
	(0.038)	(0.037)	(0.040)
Controls	No	No	No
_cons	0.082***	0.096***	0.115***
	(0.026)	(0.024)	(0.026)
Obs.	1790	1790	1790
R-squared	0.005	0.005	0.004

Standard error in parenthesis. *** *p<0.01, ** p<0.05, * p<0.1*

Note: Linear probability model regressions. Female is a female student dummy variable, T is a treatment dummy variable (having at least one female assistant in the respective course / area). The name of each column indicates the composition of the treated and control groups for each variable. The dependent variable in all of them is the same: a dummy variable equal to 1 if the student enrolled in Mathematical Economics and 0 if not.

8 Conclusions

In conclusion, taking into account all the information I presented at the beginning of this work: the lack of women has generated more lack of women in economics. The literature has shown that a very good way to empower female undergraduates to enter the profession is through exposure to more successful women, who convey to them that they too can be successful in the career. In this study, I analyzed the role played by female teaching assistants, who, although are not professionals yet, are students who have excelled and are capable of correcting tests, giving classes and guiding other students. In addition, these are women who come from a similar background and are of similar ages, which provides a very different closeness from that which a teacher can grant.

I found evidence that female teaching assistants could have a role model effect on their female students when choosing the major of economics versus business administration in the Commercial Engineering career. Specifically, having at least one female assistant in Microeconomics I implies 4.5 percentage points more in the probability of enrolling in Mathematical Economics, and 6.6 points if we consider Introduction to Economics and Microeconomics I as the economic area. This result is

[22] The detailed information for this analysis can be found in table 9 from the appendix.

robust to other specifications and the introduction of controls of academic performance of the class and of the student, and of characteristics of the teacher. In any case, all the courses with which the base model was tested are directly related to economics. When I estimated the impact of the assistants in the administration-related subjects, I verified that none of the studied subjects –Introduction to Business, Entrepreneurship Workshop and Accounting I– influence the probability of the students to choose economics.

In general, this natural experiment is a first approach to the study of women as role models in economics in Chile. Along these lines, it would be worth replicating the recent study by Porter and Serra (2020), a simple and low-cost experiment that can significantly increase female participation not only in economics, but also in other careers traditionally dominated by men. In the case of the Adolfo Ibáñez University, this thesis sheds light that a good course to implement the experiment is Microeconomics I. We have seen a positive and significant effect in this, so it is sensible to think that this could be an important turning point in deciding which way to go.

Finally, given the evidence on the impact that assistants can have on students' decisions, I suggest their work should be reformulated. We have no evidence of how seriously teaching assistants take the job part of being role models for students, or if they even think about it. Because even if they don't want it, or even if they don't try to be, they are. Letting teaching assistants realize how important their work is can make a powerful difference. We know that an intervention that aims to be inspiring and represent the possible has an impact. Therefore, professors from our faculty could have these conversations with the assistants at the beginning of each semester and empower them on the basis that their words, actions and disposition have a positive effect on the students. And by empowering I mean letting them know that this is very important. In this way, we reformulate the concept of helper, empowering them, and reinforcing the vision that students have about them.

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Appendix

Table A1: Comparison of treated - control, Introduction to Economics

Treated				**Controls**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Economics	2,039	9.37%	0.291	737	7.06%	0.256	0.057
Female	2,039	40.31%	0.491	737	42.47%	0.495	0.308
Female Teacher	2,039	0.83%	0.091	737	1.09%	0.104	0.535
PSU Mathematics	1,946	685	38.745	680	682	33.590	0.101
PSU Spanish	1,946	636	58.846	680	630	57.319	0.036
Ranking	1,933	669	69.137	680	666	66.797	0.350
Grade	2,039	4.68	0.591	737	4.80	0.583	0.000

Note: Treated correspond to students who had at least one female assistant in Introduction to Economics. "Grade" corresponds to the final average of the student in Introduction to Economics. The P value corresponds to the balance test of both groups.

Table A2: Comparison of treated - control, Microeconomics I

Treated				**Controls**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Economics	2,154	9.24%	0.290	622	7.07%	0.257	0.093
Female	2,154	40.30%	0.491	622	42.93%	0.495	0.240
Female Teacher	2,154	30.50%	0.461	622	59.97%	0.490	0.000
PSU Mathematics	2,037	684	37.835	589	684	36.304	0.702
PSU Spanish	2,037	636	57.925	589	629	60.158	0.011
Ranking	2,028	669	69.234	585	663	65.892	0.058
Grade	2,132	4.54	0.843	567	4.63	0.841	0.021

Note: Treated correspond to students who had at least one female assistant in Microeconomics I. "Grade" corresponds to the final average of the student in Microeconomics. The P value corresponds to the balance test of both groups.

Table A3: Comparison of treated - control, Calculus I

Treated				**Controls**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Economics	1,332	7.88%	0.270	1444	9.56%	0.294	0.119
Female	1,332	39.56%	0.489	1444	42.11%	0.494	0.174
Female Teacher	1,332	41.37%	0.493	1444	52.01%	0.500	0.001
PSU Mathematics	1,272	682	36.899	1354	686	37.958	0.009
PSU Spanish	1,272	632	58.797	1354	637	58.128	0.033
Ranking	1,266	663	66.875	1347	672	69.792	0.001
Grade	1,332	4.70	0.745	1444	4.78	0.730	0.004

Note: Treated correspond to students who had at least one female assistant in Calculus I. "Grade" corresponds to the final average of the student in Calculus I. The P value corresponds to the balance test of both groups.

Table A4: Comparison of treated - control, Calculus II

Treated				**Controls**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Economics	1,232	7.95%	0.271	1544	9.39%	0.292	0.183
Female	1,232	37.09%	0.483	1544	43.91%	0.496	0.000
Female Teacher	1,232	56.09%	0.496	1544	56.67%	0.496	0.273
PSU Mathematics	1,172	683	38.380	1454	685	36.726	0.061
PSU Spanish	1,172	632	59.269	1454	636	57.812	0.067
Ranking	1,169	664	68.824	1444	671	68.155	0.008
Grade	1,222	4.60	0.723	1544	4.85	0.741	0.000

Note: Treated correspond to students who had at least one female assistant in Calculus II. "Grade" corresponds to the final average of the student in Calculus II. The P value corresponds to the balance test of both groups.

Table A5: Comparison of treated - control, Algebra I

Tratados				**Controls**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Economics	1,330	9.10%	0.2876852	1446	8.44%	0.278	0.539
Female	1,330	41.05%	0.4921144	1446	40.73%	0.492	0.864
Female Teacher	1,330	38.35%	0.4864114	1446	42.25%	0.494	0.011
PSU Mathematics	1,259	683	37.32252	1367	685	37.624	0.107
PSU Spanish	1,259	633	56.73962	1367	635	60.059	0.280
Ranking	1,259	665	67.39701	1354	670	69.528	0.087
Grade	1,330	4.80	0.7534996	1446	4.82	0.358	0.048

Note: Treated correspond to students who had at least one female assistant in Algebra I. "Grade" corresponds to the final average of the student in Algebra I. The P value corresponds to the balance test of both groups.

Table A6: Comparison of treated - control, Introduction to Business

Tratados				**Controls**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Economics	1,558	9.69%	0.296	232	7.76%	0.268	0.348
Female	1,558	41.85%	0.493	232	52.59%	0.500	0.002
Female Teacher	1,558	2.89%	0.168	232	0.00%	0.000	0.009
PSU Mathematics	1,389	687	36.353	222	677	31.708	0.000
PSU Spanish	1,389	640	57.744	222	634	51.234	0.165
Ranking	1,443	668	67.052	229	696	67.943	0.000
Grade	1,558	5.40	0.478	232	5.47	0.492	0.029

Note: Treated correspond to students who had at least one female assistant in Introduction to Business. "Grade" corresponds to the final average of the student in Introduction to Business. The P value corresponds to the balance test of both groups.

Table A7: Comparison of treated - control, Entrepreneurship Workshop.

Treated				**Controls**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Economics	1,512	9.59%	0.295	278	8.63%	0.281	0.616
Female	1,512	42.46%	0.494	278	47.48%	0.500	0.121
Female Teacher	1,512	4.83%	0.214	278	14.39%	0.352	0.000
PSU Mathematics	1,355	686	35.674	256	683	36.993	0.277
PSU Spanish	1,355	638	56.616	256	641	58.527	0.585
Ranking	1,409	672	68.249	263	675	65.442	0.448
Grade	1,512	5.69	0.567	278	5.78	0.454	0.0179

Note: Treated correspond to students who had at least one female assistant in Entrepreneurship Workshop. "Grade" corresponds to the final average of the student in Entrepreneurship Workshop. The P value corresponds to the balance test of both groups.

Table A8: Comparison of treated - control, Accounting I.

Treated				**Controls**			
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Economics	1,535	9.32%	0.291	255	10.20%	0.303	0.657
Female	1,535	43.97%	0.497	255	38.82%	0.488	0.124
Female Teacher	1,535	0.00%	0.000	255	0.00%	0.000	.
PSU Mathematics	1,439	684	36.383	245	684	42.878	0.961
PSU Spanish	1,439	640	56.849	245	648	58.041	0.035
Ranking	1,430	672	68.256	242	676	65.098	0.341
Grade	1,535	4.67	0.703	255	4.78	0.735	0.0136

Note: Treated correspond to students who had at least one female assistant in Accounting I. "Grade" corresponds to the final average of the student in Accounting I. The P value corresponds to the balance test of both groups.

Table A9: Characterization of assistants, administration courses.

Variable	**Total**			**Female Assistants**			**Male Assistants**			
Introduction to Business	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	P Value, t-test
Female Teacher	163	6.13%	0.241	112	4.46%	0.207	51	9.80%	0.300	0.190
Full-time	163	62.58%	0.485	112	68.75%	0.466	51	49.02%	0.505	0.016
Average Performance	162	5.30	0.500	111	5.29	0.556	51	5.341	0.350	0.529
Entrepenuership Workshop										
Female Teacher	138	5.80%	0.235	88	2.27%	0.150	50	12.00%	0.328	0.019
Full-time	138	52.17%	0.501	88	53.41%	0.502	50	50.00%	0.505	0.703
Average Performance	138	5.45	0.404	88	5.45	0.398	50	5.44	0.418	0.861
Contabilidad I										
Female Teacher	197	0.00%	0.000	95	0.00%	0.000	102	0.00%	0.000	.
PhD	197	20.81%	0.407	95	15.79%	0.367	102	25.49%	0.438	0.095
Full-time	197	40.10%	0.491	95	35.79%	0.482	102	44.12%	0.499	0.236
Average Performance	175	3.95	1.075	85	4.10	0.913	90	3.81	1.196	0.074

Note: The observations correspond to assistants from Introduction to Business, Entrepreneurship Workshop and Accounting I. It should be noted that there may be more than 1 assistant per course. The first set of columns corresponds to the percentage of the total assistants in the sample that was associated with each variable. It can be read as follows: 6.13% of the total assistants were a female teacher's assistant, 62.58% were a full-time teacher's assistant, etc. The average yield is that of the section. The second and third part of the table correspond to the total of the assistants filtered by gender and the P value corresponds to the t-test of these two groups.

Table A10: Model results for assistants of the major in Economics

	(1) Introduction to Economics	(2) Microeconomics I	(3) Calculus I	(4) Calculus II	(5) Algebra I	(6) Economic Area	(7) Mathematic Area
Female	-0.028**	-0.035**	-0.038***	-0.038***	-0.033***	-0.039**	-0.042***
	(0.013)	(0.015)	(0.012)	(0.012)	(0.012)	(0.018)	(0.013)
T	0.018	-0.005	-0.037	-0.066***	-0.020	-0.008	-0.049***
	(0.019)	(0.016)	(0.023)	(0.018)	(0.027)	(0.016)	(0.016)
T * Female	-0.019	0.004	0.045	0.031	-0.008	0.010	0.034
	(0.026)	(0.023)	(0.035)	(0.027)	(0.036)	(0.023)	(0.024)
Controls	No	No	No	No	No	No	No
_cons	0.102***	0.109***	0.110***	0.114***	0.108***	0.112***	0.118***
Obs.	(0.009)	(0.011)	(0.008)	(0.009)	(0.008)	(0.013)	(0.010)
R-squared	2592	2592	2592	2592	2592	2592	2592
Female	0.004	0.003	0.004	0.007	0.004	0.003	0.006

Standard error in parentheses. **** p<0.01, ** p<0.05, * p<0.1*

Note: Linear probability model regressions. Female is a female student dummy variable, T is a treated dummy variable (having at least one female assistant with a degree in economics in the respective course / area). The name of each column indicates the composition of the treated and control groups for each variable. The dependent variable in all of them is the same: a dummy variable equal to 1 if the student enrolled in Mathematical Economics and 0 if not.

Table A11: Average evaluation of assistants by course and gender.

Asignatura	General	Female	Male	P Value, t-test
Introduction to Economics	5.42	5.51	5.34	0.144
Microeconomics I	5.64	5.67	5.62	0.538
Macroeconomics I	5.80	5.75	5.82	0.486
Microeconomics II	5.65	5.61	5.67	0.481
Caculus I	6.01	6.21	5.81	0.006
Caculus II	5.90	5.98	5.76	0.402
Algebra I	5.81	5.90	5.73	0.287
Introduction to Business	5.89	5.89	5.88	0.942
Entrepenuership Workshop	6.07	6.02	6.15	0.119
Accounting I	5.66	5.66	5.62	0.978

Note: The values correspond to the average grade assigned to the assistants of each course, grades from 1.0 to 7.0. The value corresponds to the mean test for the mark between male and female assistants.