Increasing Female Undergraduate Majors in Economics: A Case Study

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Women are under-represented in the economics profession. The resulting imbalance has negative consequences for women, the profession, and policy. Women making career choices may receive distorted signals and underinvest in human capital. If this is so, the productive potential of women is not being realized, and the resulting employment pattern is inefficient. Underinvestment in human capital exacerbates the gender gap in wages (Kirkeboen, Leuven, and Mogstad 2016), and, from a societal perspective, reduces overall productivity. Absence of role models and lack of access to networks further affects productivity negatively. Moreover, since men and women tend to specialize in different sub-fields, research and teaching output may become distorted. Finally, men and women have different policy positions on such issues as inequality, the role of government, and the environment (May, Mary, McGarvey and Whaples 2014). If diversifying the set of opinions that influence policy is important, one option would be to diversify the students who receive an economics education.[2]

Why do fewer women choose to major in economics? There is a considerable body of evidence to show that institutional factors and stereotypes, rather than preferences, play a role in this distribution (e.g. Garther and Schneebaum 2023). Some possible contributing factors, documented in the literature, are informational inefficiencies, perceptions of ability, lack of role models and institutional practices (Avilova and Goldin 2018). A popular stereotype is that

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[2] The former Chair of the Federal Reserve, Janet Yellen, unusually for a Fed Chair, commented with some frequency on economic inequality generally and gender inequality specifically – see for example: "So We All Can Succeed: 125 Years of Women's Participation in the Economy" at the 125 Years of Women at Brown Conference, sponsored by Brown University, Providence, Rhode Island, May 5, 2017.

economics and finance (or business) are the same thing. Since the finance industry is dominated by white men, women may be less attracted to a degree in economics. Incoming students are not necessarily aware of the relevance of an economics degree to such sectors as the law, government, non-profit institutions and international organizations. Women's apparently higher sensitivity to grades, especially in introductory classes, also contributes to low female participation. The lack of female role models, mentors, and advisors can create a less than welcoming environment. Finally, institutional practices can be a significant barrier. For example, course offerings may be based on tradition, with little thought given to topics that may appeal to female students specifically.

Beyond theory, we can draw on empirical studies designed to increase the number of female undergraduates in economics and other disciplines. In economics, the most well-known is the Undergraduate Women in Economics Challenge (UWE) initiated in 2015 by Claudia Goldin. UWE employs a randomized controlled methodology to evaluate the impact of better course information, mentoring, encouragement, career counseling, and more relevant instructional content on the gender gap (Avilova and Goldin 2018).

The UWE interventions did slightly increase the fraction of female BAs who majored in economics relative to men in liberal arts colleges, but no impact was found among large universities as a whole. However, some universities that implemented their own RCTs within the UWE challenge found positive results. For instance, role model interventions increased the fraction of women taking the intermediate course and majoring in economics (Porter and Serra 2020; Patnaik et al. 2023). Providing better information and mentoring increased the probability of female students with median grades or above majoring in Economics (Li 2018; Bedard, Dodd, and Lundberg 2021; Halim, Powers, and Thornton 2022).

Beyond these experiments, several institutions have initiated programs to try to increase female and/or minority representation. For example, in 1995 the University of Michigan established the Women of Color in the Academy Project (WOCAP). The project showcased the academic contributions of women of color faculty by sponsoring a lecture series and organizing a conference to facilitate networking. Recipients of the recently instituted AEA Diversity and Inclusion Awards have also engaged in interventions to increase the diversity of their majors.[3] These strategies are to be applauded, though the evidence on measurable outcomes is mixed.

The problem of low female participation exists not only in economics, but also in many STEM programs. For example, in 2005, Harvey Mudd College's Computer Science Department implemented minor changes to its program including creating a female-friendly introductory class and providing female students funds for travel to conferences. Seven years later the proportion of computer science degrees earned by women had risen from less than 10% to 40% (Alvarado, Dodds, and Libeskind-Hadas 2012).

The Committee on the Status of Women in the Economics Profession has been collecting data on the proportion of women at all levels of the profession for more than fifty years. In 1972, 12 per cent of undergraduate economics majors were women. Great progress was made in the seventies, eighties and early nineties, so that by 1997 the share of female undergraduates in economics at all doctoral-granting institutions was 30%. However, since that time progress has slowed. The most recent CSWEP Report (Chari 2023) urges that, due to stagnation and decline in female representation across the profession, "individual departments and schools, as well as the discipline as a whole, need to strengthen and innovate their efforts to attract and advance women." In this paper, we document sustained initiatives at our institution

[3] AEA website – https://www.aeaweb.org/about-aea/honors-awards/outstanding-achieve-diversity-inclusion

over a twelve-year period, including informational outreach, faculty presentations, hiring of teaching faculty, an increased range of courses, and a female-run policy seminar with diverse speakers and topics. We also provide evidence of a substantial increase in the proportion of female economics majors over the same time period. While we cannot prove definitively which initiatives were most effective, given that the interventions used explicitly address well-documented barriers observed in the theoretical and empirical literature, it may be that similar results can be achieved in other institutions.

I. Initiatives to Increase Female Participation in the Economics Major

We tried to systematically address the barriers to female representation predicted by theory and empirical evidence, using the relatively few resources we had at our disposal, and sometimes aided by broader institutional initiatives

To address the issue of informational inefficiencies, starting in 2012, we outreached to incoming freshmen and their parents, admissions counselors, and high school counselors. We emphasized the many fields economics embraces and the diverse career opportunities outside of finance open to those with an economics degree. In Principles classes we instituted short faculty presentations, or faculty interviews posted online, to showcase the research areas of our faculty. A revamp of the Departmental website allowed us to post "Student Profiles" where graduating seniors discussed their experience in the department, their favorite classes, the majors they combined, and their future career plans.

To address the issue of grade sensitivity and lack of confidence, we reached out to individual students in the Principles classes and among our advisees. A newly established Economics Club arranged mixers where freshmen and sophomores were given more information about the content of upper-level classes. A bi-weekly "Reality Lunch" brought together selected

undergraduates, graduate students and faculty to discuss current policy issues. We participated in a PILOT program, initially started in some science disciplines, that utilized undergraduate tutors, meeting on a weekly basis to help students with Principles classes.[4] In all of these endeavors we made sure that women specifically were the focus of our attention.

A university initiative to hire more teaching faculty generated a diverse pool of applicants more heavily committed to teaching and advising than research. Five new teaching faculty, hired in 2017 and 2021, brought numerous benefits. Firstly, they acted as role models for female (and URM) students both as teachers and advisors. Secondly, over time, they began to take on the teaching of Principles classes, an unprecedented step. Thirdly, these new hires allowed all faculty, tenure track and teaching alike, to offer a broader range of courses including courses in social policy, health and education, environmental policy and gender economics.

A Deanal initiative further attracted students to economics. From 2013, the Economics Department became involved in the teaching of a large introductory class on Inequality joint with the Departments of Sociology and Political Science. Students in this class realized that topics such as labor market discrimination, health inequality and the unequal effects of policy could be studied within the Economics major.

In 2017, four female students from this introductory class, recent converts to the major, asked for more focus on policy. Thus, was born a student-run undergraduate policy seminar, the Economics Policy Issues Colloquium (E.P.I.C.). Its main goal is to present research on a range of topics from a diversity of viewpoints. From the beginning, the committee was female-dominated

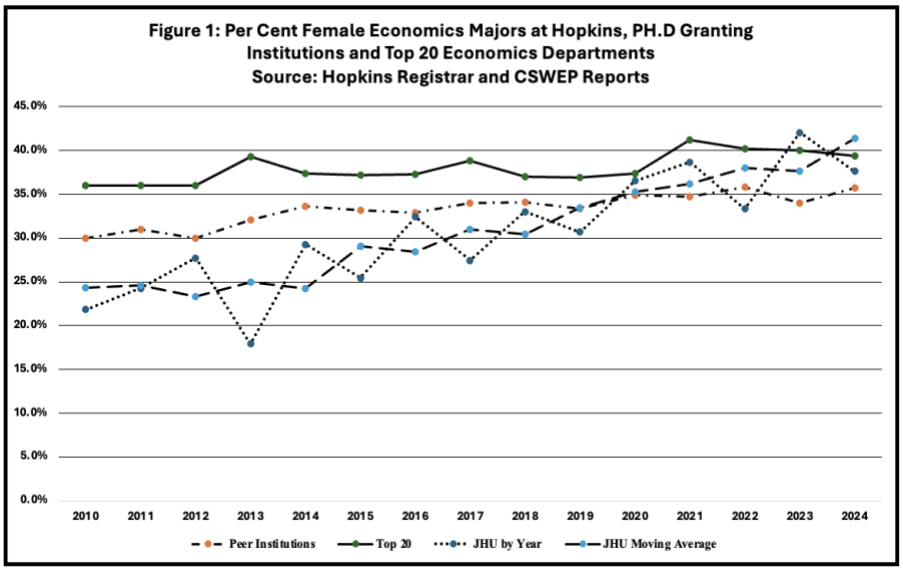
[4] We are currently conducting a more intensive study of this program. Undergraduate tutors are more diverse than our regular TAs and students can select their tutorial groups based on tutor as well as time slot.

and continues to be so to this day.[5] With topics ranging from child-care policy to neuroeconomics from climate change to diversity in economics, our seminar opened up to students a wealth of possibilities for economics careers and economics research. The seminars have evolved over time to include panels of faculty and graduate students "reflecting" on their economics journeys, both of which are highly popular events. The Committee members benefitted from learning how to organize seminars, introduce speakers, and generally to assert themselves in a public economics forum, and were enthusiastic in engaging fellow-students. Being able to participate in a female-run seminar whose audience is at least fifty-percent female has proved to be a major attraction and confidence-booster.

II Trends in Female Share in the Economics Major

What impact did these initiatives have on the gender distribution of our major? Data on female economics majors since 2010 for doctoral institutions, top twenty schools and Johns Hopkins are shown in Figure 1. From 2010 – 2024, doctoral-granting institutions on average saw a 6 percentage point increase in the proportion of undergraduate economics majors who were female, from 30% to 36%. Top twenty schools, starting from a significantly higher baseline of 36%, saw a more modest increase of just under 4 percentage points on average (Chari 2023). The share of female economics majors at Hopkins showed a more substantial increase. In terms of annual percentages, our institution started at a much lower level than either peer or top twenty institutions, at 22% in 2010. It then fell to a low of 18% in 2013, increasing to 38% in 2024. Three-year moving averages for Hopkins show a 17 percentage point increase, from 24 per cent in 2010 to 41 per cent in 2024.

[5] Future committee members are selected based on an open application process. We encourage men to apply, and have had several male Committee members over the years, but the applications to join the group are overwhelmingly female, as is attendance.

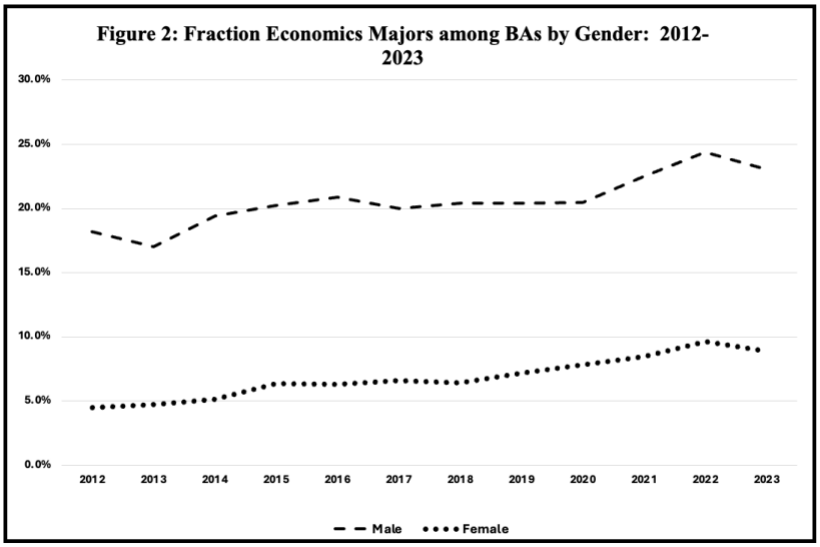


One drawback of the above measure is that it does not account for changes in gender-specific admittance rates (supply) or overall degrees awarded (completion). The share of female students admitted to Hopkins School of Arts and Sciences has changed little over the period, averaging just over 56%, in contrast to the increasing share of female economics majors.

Avilova and Goldin (2024) document trends over time in the gender gap for undergraduate economics majors using measures that account for overall degrees awarded. Figures 2 and 3 illustrate these measures for Johns Hopkins over the period 2012-2023. Figure 2 graphs the fraction of Economics majors among B.A. degrees awarded in the School of Arts and Sciences. [6] In 2012, the fraction of male economics majors among all degrees awarded was 18.2% and of female economics majors 4.5%. The corresponding figures in 2023 were 23.0% and 8.9%. Women made substantial progress relative to men, almost doubling their percentage of overall majors over the eleven-year period. This progress can be compared to the top 100

[6] 95% of degrees awarded in the School of Arts and Sciences are B.A. degrees.

universities shown in Avilova and Goldin (2024).[7] The increased female share at Hopkins over this period is impressive.



Avila and Goldin's preferred measure of undergraduate female advancement, adjusting for degree completion, is a "conversion ratio" calculated over institutions (*i*) and years (y) as:

$$(1) \qquad \frac{\sum_i \text{Male Economics Majors}_{iy} \Big/ \sum_i \text{Female Economics Majors}_{iy}}{\sum_i \text{Male B. A. s}_{iy} \Big/ \sum_i \text{Female B. A. s}_{iy}}$$

The conversion ratio thus tries to capture the degree to which students "convert" i.e. choose a first or second economics major, controlling for overall B.A. degrees awarded.

In Figure 3 we present three different versions of this ratio for our own institution. Since we find increasingly that many students switch to economics (or add an additional major) not only from such disciplines such as International Studies, or History, but also from Applied Math or Computer Science, we graph this conversion ratio for both the School of Arts and Sciences and the School of Engineering, as well as the combined ratio.

[7] The fraction of male economics majors among all degrees awarded for the top 100 universities increased from 6.8 % in 2012 to 7.1% in 2020 and that of female economics majors from 3% to 3.4%. The figures for Hopkins over the exact same period are an increase from 18.2%.to 20.5% for men and an increase of 4.5% to 7.8% for women.

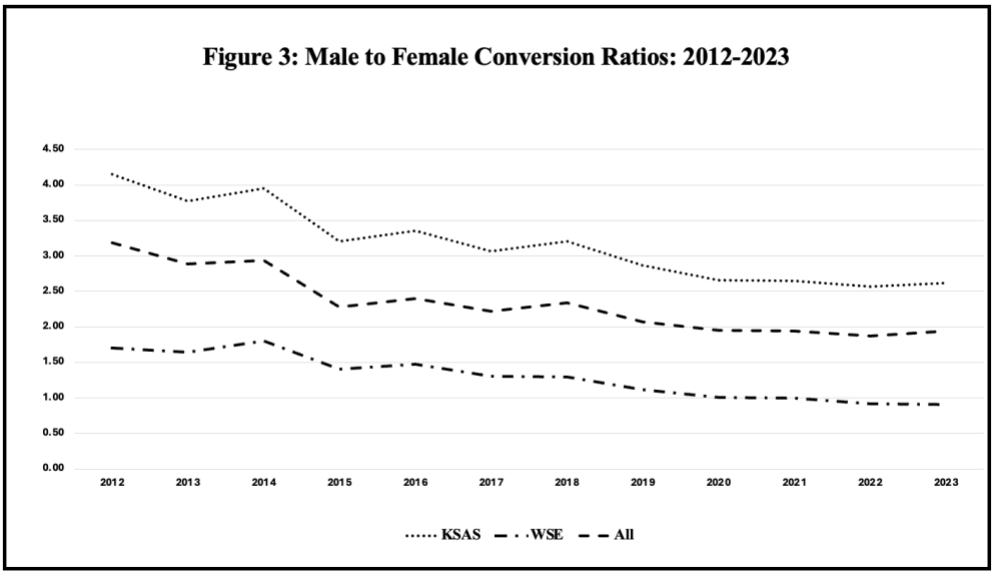


Figure 3 shows that all three measures followed the same downward trend over the period. For example, the conversion ratio that includes both the School of Arts and Sciences and the School of Engineering declines from 3.18 in 2012 to 1.90 in 2023.[8] This means that men were approximately three times more likely than women to choose economics as a major or second major in 2012, but less than twice as likely a decade later.

In sum, through a variety of measures, we hope to have demonstrated substantial progress in increasing the proportion of female undergraduate economics majors at our institution.

III Discussion and Conclusion

We have documented a range of initiatives that appear to have impacted female representation among economics majors in our department. Some efforts, such as informational outreach, were relatively easy to implement; others, such as organizing and advising a policy seminar, took considerable effort on the part of one or two individuals; yet others involved taking advantage of wider University-led initiatives. We recognize that this is a case study that may not

[8] For comparison, the conversion ratio for B.A. majors for the top 100 universities declined from 2.3 in 2012 to 2.1 in 2020 (Avilova and Goldin 2024).The figures for Hopkins over the exact same period are a decline of from 4.1 to 2.7 for the School of Arts and Sciences, from 1.7 to 1.0 for the School of Engineering and from 3.2 to 1.9 for both schools combined.

apply to all environments. Moreover, we have no definitive proof that any one of our strategies was more decisive in "shifting the needle" than any other. But we hope that the avenues suggested here will inspire other departments who are eager to use departmental and institutional resources to fully realize the productive potential of female undergraduates.

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