



Still staying away: Women and the economics major – evidence from two Southern liberal arts colleges

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Abstract

This article extends the literature that examines the underlying reasons for the gender imbalance in the field of economics. Previous research suggests that women are less likely to major in economics because of the lack of female role models in the subject (Ashworth and Evans 1999), math anxiety (Dyanan and Rouse 1997), and the influence of parents' education levels (Leppel 2001) and career preferences (Turner and Bowen 1999). These papers have focused on data collected from nonsectarian, coeducational institutions located in the Northern United States. We focus our analysis on the choice of major at two Southern liberal arts colleges, Davidson College, which is affiliated with the Presbyterian Church, and Salem College, a women's college that is affiliated with the Moravian Church. We find that women are still less likely to major in economics than men, and that attending a women's college has no effect on this result. However, we find that the likelihood of majoring in economics rises if students have a female instructor for an economics course, if they have completed calculus in high school, or if they perceive that their job prospects are better after majoring in economics.

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1. Introduction

Women continue to constitute a minority of the students who graduate from American colleges and universities with a degree in economics. In 1966, nine percent of all students graduating with an undergraduate degree in economics were female. In 2006, this figure had increased, but only to 31 percent. (National Science Foundation 2008) Understanding the reasons behind this gender gap is critical. Students who earn their degree in economics remain among the most sought after and most highly compensated in American labor markets. Thus, a persistent gender imbalance in the production of graduates with economics degrees contributes to pay gaps between men and women. Moreover, economists should be aware of, and potentially concerned with, the effects that a lack of female economists may have on the body of research produced by our profession.

Given the importance of attracting high quality female students to the economics major, economists have spent a good deal of effort to try to understand why women are shying away from economics in college. Seminal work in this area completed by Jensen and Owen (2000) is based off of a survey that was given to students enrolled in introductory economics courses at top ranked, co-educational liberal arts colleges. Our research adds to the existing literature in two ways. First, we obtained our data from a survey we sent out to the entire student populations attending two Southern liberal arts colleges – Davidson College and Salem College.³ Our decision to collect our data from the entire student populations at Davidson and Salem allowed us to hold key factors constant: We surveyed students from well respected liberal arts colleges with a church affiliation, located in the South.⁴ As a result, we are better able to focus on the key difference between the institutions - that Salem is a women's college. In the sections that follow, we begin by briefly reviewing the major contributions to the existing literature. Section three introduces our data set. Section four provides a discussion of our models and an analysis of the results from estimating the models. Finally, section five provides some concluding remarks as well as suggestions for possible directions for future research.

2. Literature Review

Previous research suggests that the economics curriculum includes topics of less interest to women and that the evaluation favors male learning styles (Anderson and Siegfried, 1997). Ashworth and Evans (2001) point out that the lack of female role models in economics leads to a lack of interest among women to study economics. This is confirmed by Rask and Bailey (2002) who find that if students have a faculty member “like them” - i.e. with the same gender, age, ethnicity – the probability of choosing the major in which the faculty member teaches increases. Jensen and Owen (2000) examined a large number of factors that influence the choice of major, including grade point average and expected grade, math SAT scores, and interest in economics careers and entrance into graduate school. Their results showed that student characteristics and attitudes are crucial determinants of the decision to continue to study economics. Dynan and Rouse (1997) found that a student's background in mathematics accounted for part of the gender difference in the decision to major in economics; and that, while women generally had a lower relative performance in economics, controlling for this factor diminishes the gender gap in the choice of economics as a major. Turner and Bowen (1999) find that SAT scores do not explain the gender preferences in choosing a major. They

³ Salem College accepts adult (23+) male undergraduate students, but only women are allowed to live in on-campus residence halls. Salem markets itself as a women's college.

⁴Salem College is affiliated with the Moravian Church and Davidson College is affiliated with the Presbyterian Church (PC – U.S.A.) Both schools are located in North Carolina.

find that other factors like labor-market expectations or gender-specific effects of the college experience (coeducational one gender institution) provide a better explanation. They find that women at all female schools were more likely to switch to fields traditionally dominated by men than were women at coed institutions. Zafar (2009) finds that non pecuniary factors are most important in the major decisions of females, while pecuniary outcomes (i.e. salary after graduation) explain a substantial part of the choice of major for males.

3. Data

We used Survey Monkey to send an electronic survey to the undergraduate populations of Salem and Davidson. We sent the survey on April 23, 2010 and gave students until May 2 to respond. The timing of the survey was intentional. We followed the lead of Jensen and Owen and selected dates that were quite close to the time that students were asked to sign up for courses for the following term, thereby making them more aware of the factors that influenced their choice of courses and major. The survey asked questions about the student’s academic profile (major, reason for choice of major, GPA), socioeconomic background (parents’ education and employment, religion), and their exposure to economics and math classes. We received 755 responses, which corresponded to response rates of 19% at Salem College and 33% at Davidson College. Of the students responding to the survey, 21.7% were enrolled at Salem, 71.6% were female, 7.6% had selected economics as their major, and 72.8% reported completing a high school calculus course.⁵ Additionally, 63.4% of the respondents attended a high school that offered an economics course, though only 37% of the respondents made use of this opportunity.

4. Estimation and Results

We estimate a probit model of the following general form:

Econ Major =	f (gender, student academic profile, socioeconomic background, exposure to math/economics)
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Econ Major is the dependent variable in every specification of the model that we estimated, and it takes the value of 1 if a student reported that he or she had selected economics as a major. Table 1 presents results from four specifications of our model. Columns 1, 2, and 3 represent three different versions of our base specification. Columns 1 and 2 report results using our full data set, with the difference between the two specifications simply being the inclusion of a dummy variable to control for students who attended Salem College. Column 3 reports results using only observations from Davidson College. Several interesting patterns emerge. It appears that Salem and Davidson students do not choose economics because of interest in the subject or the perceived rigor of the major.⁶ Focusing on column 3, Davidson students who reported choosing their major because of their confidence in their ability in their chosen field were roughly 2 percentage points less likely to have chosen economics as their major. Also worth noting is the fact that parental influence isn’t a statistically significant influence on Davidson students who selected economics as their major. Students at Davidson may also be less sensitive to teacher quality. Examining columns 1 and 2, we find that

⁵ We received responses from both male and female students enrolled at Salem.

⁶ MS represents a “Major Selection” variable. In other words, the “MS” variables indicate that the student responded that she chose her major for the reason indicated – interest in the subject, confidence in her ability in the subject, rigor of the subject, the quality of the instructors in the subject, career opportunities for majors from this subject, and parental influence.

students who listed teacher quality as a factor in choosing their major were approximately 2 percentage points less likely to have selected economics as their major. The magnitude of this effect remains the same in column 3, yet it is no longer statistically significant. It is necessary to use caution when interpreting this result. This may mean that Davidson students who chose economics were determined to choose economics regardless of whether the department has “high quality” teachers relative to the other departments. It may also mean that Davidson students don’t perceive significant differences in the quality of teaching among the college’s departments.

Table 1. Results

<i>Dependent variable is Econ Major/ Variable</i>	<i>Model (1)</i>	<i>Model (2)</i>	<i>Model (3)</i>	<i>Model (4)</i>
Gender	-0.037***	-0.044***	-0.042***	-0.033**
Salem Student	-0.017			-0.014
MS Interest	-0.016	-0.001	-0.004	-0.020
MS Confidence	-0.012	-0.013	-0.023*	-0.011
MS Rigor	0.011	0.013	0.012	0.012
MS Instructor Quality	-0.023*	-0.023*	-0.021	-0.024**
MS Career	0.039***	0.038***	0.051***	0.036***
MS Parental Influence	0.062**	0.059**	0.049	0.065**
HS Calculus	0.043***	0.048***	0.053***	0.038***
HS Econ	0.036***	0.035***	0.056***	0.037***
Female Instructor Econ	0.137***	0.133***	0.115***	0.131***
High SAT				0.029**
Mom College				-0.0162
Dad College				-0.012
Pseudo R2				
Observations	755	755	591	755

Note: Table 1 reports marginal effects. *** Significant at the .01 level, ** .05 level, and * .10 level.

Regardless of the specification, a student’s decision to take calculus or economics in high school led to a 3 to 5 percentage point increase in the likelihood that they would report economics as their chosen major. This result isn’t surprising, but what is surprising – indeed encouraging – is that students (at both colleges) who completed at least one economics course with a female instructor were at least 10 percentage points more likely to choose economics as their major. We estimated additional specifications of this base model interacting gender with the other independent variables. We found no statistically significant evidence of a differential effect for women, though taking calculus in high school dampens women’s tendency to stay away from economics.⁷

Column 4 reports results from one additional specification of our model. This specification is representative of our efforts to fully explore the factors that influence students’ selection of major at Davidson and Salem. We estimated several different versions of the model that included information we collected in the survey about students’ religious affiliation, how often they attended church, whether their parent(s) was employed full time, etc. Because these factors did not have a statistically significant influence on students’ choice of major, and because our decision to omit these factors did not materially change the size or statistical significance of the effects of interest, we haven’t reported these results. However, the results from column 4 provide two findings of interest. Student who excel on the SAT are 3 percentage points more likely to report that they’ve selected economics as a major. Finally, students who reported that either their mom or their dad graduated from college were

⁷ We will gladly provide the results from these regressions upon request.

approximately 1 percentage point less likely to report economics as their chosen major. (However, the effects are not statistically significant.)

5. Conclusion

As with Jensen and Owen (2000), our results are interesting as much for what we did not find as for what we did. Our results are consistent with Jensen and Owen's in that perceived career opportunities have a positive effect on a student's likelihood of choosing economics as her major. We did not, however, find that students at Davidson and Salem selected economics as their major because of their interest in the subject. This result is surprising, and it warrants further study. What is perhaps most surprising of all, though, is that women at Salem are still less likely to major in economics than other subjects. We had anticipated that women might be more willing to major in a subject that is perceived as being "male-dominated" if there were very few (or zero) men in the classroom. At Salem College, however, this isn't the case. Based on the results of our study, we believe that there remains a need for additional research in this area. Finally, we think there is an important policy implication to be taken from our findings. Given that women who are exposed to calculus in high school are more likely to major in economics than women who aren't, we have discovered evidence of yet another reason that high school administrators should encourage women to continue their study of mathematics.

At Davidson, women routinely perform very well in economics courses and frequently earn departmental awards. At both Davidson and Salem, women are excellent undergraduate economists. Why more female students at these colleges don't choose economics as their major continues to be a mystery.

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