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A Comparison of the Rank and
Salary of Male and Female
Agricultural Economists

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A Comparison of the Rank and Salary of Male and Female Agricultural Economists

The Committee on Opportunities for and Status of Women in Agricultural Economics was established by the Executive Board of the American Agricultural Economics Association (AAEA) in September 1980. The charge to the Committee was "to ascertain the opportunities, role, and status of women in agricultural economics."¹ Two important determinants of status within the profession are rank and salary. The objectives of this paper are, first, to develop a profile of women within the agricultural economics profession. The distribution of female agricultural economists by type of job, level of education, and among academics, tenure status, are analyzed along with data on salaries, experience, and research productivity. Second, the relative rank of women within the profession is explored by comparing profile data of male and female AAEA members. Finally, a model is developed to determine if significant salary differentials exist between men and women of comparable rank. Conclusions about the current status of women in agricultural economics are presented.

A Profile of Female Agricultural Economists

Data for this analysis were obtained from a survey of men and women within the profession (Lundeen). In an attempt to survey all female agricultural economists, 540 women with a possible interest in agricultural economics were contacted by the Committee. Responses to the survey as of July 1, 1981 totaled 159 women, 89 of whom are members of the AAEA. Data in Table 1 illustrate the distribution of women by type of job, level of

Table 1. Distribution of Female Agricultural Economists by Selected Characteristics

Type of job	Level of Education	Academic Tenure Status	Respondents ^a		Mean Salary	Average Years Since Last Degree	Average Number of Publications per Year
			Number	Percent			
Academic	Ph.D.	Tenure	14	11.2	\$31,071	13.1	.8
		Tenure Track	10	8.0	21,000	3.9	1.7
		Nontenure Track	6	4.8	18,333	15.2	.4
		Not Applicable	2	1.6	5,000	NR	NR
	Without Ph.D.	Tenure	1	.8	22,500	23.0	.4
		Tenure Track	3	2.4	19,167	6.0	1.5
		Nontenure Track	14	11.2	11,428	3.6	1.4
		Not Applicable	12	9.6	7,083	2.4	.4
		No Response	1	.8	22,500	5.0	4.8
Subtotal			63	50.4	17,659	6.8	.9
Government	Ph.D.		14	11.2	33,269	6.6	1.6
	Without Ph.D.		24	19.2	20,833	4.5	.6
Subtotal			38	30.4	25,203	5.3	1.0
Business	Ph.D.		6	4.8	26,667	4.8	.6
	Without Ph.D.		18	14.4	19,265	4.2	.9
Subtotal			24	19.2	21,196	4.3	.8
Total			125	100.0	20,589	5.8	.9

^aInformation on type of job was not complete for 34 respondents. These data were not included in this table.

education, and academic tenure status where applicable. Mean salaries, average years since the last degree, and average number of publication per year are calculated for each category.

Of the 125 women who listed an identifiable current job, approximately 50 percent are academics, 30 percent are employed by government (state or federal), and the remainder are working for business and nonprofit corporations. The mean annual salary for all women surveyed is \$20,589. Highest average salaries are reported by women with a Ph.D. employed by government. The lowest salaries are earned by non-Ph.D. academics without tenure, many of whom may be graduate students on assistantships. For all academics, the average annual salary of \$17,659 is less than the average earnings of both government and business employees. It should be recognized that the inclusion of graduate students in the academic category may bias these salary comparisons.

The female survey respondents averaged just under six years since receiving their last degree. Overall, academics had more years of experience than government or business employees. The average number of journal articles and papers published per year was also calculated. All women surveyed averaged slightly less than 1 publication each year since their last degree was received.

Comparison of Male and Female Agricultural Economists

Questionnaires were sent to 239 males most of whom were randomly selected from the 1981 AAEA membership list (Lundeen). One hundred thirty-one men responded by July 1, 1981. Because of the sampling frame used, most of the men surveyed were AAEA members while only 56 percent of women surveyed were Association members. Although the differences between AAEA women and all women surveyed appear slight, to ensure comparable groups the responses were stratified for 104 male respondents and 72 female respondents with AAEA

memberships.² These data are reported in Table 2. Type of job, level of education, and academic tenure status were tabulated in addition to mean salaries, average years since last degree, and average number of publications per year for each job category.

Academics

Of the respondents with academic jobs, 55 percent of the men were tenured, compared to 24 percent of the women. A higher proportion of women than men did not have a Ph.D: 51 percent of the women compared to 14 percent of the men. The "not applicable" response to questions about tenure status may indicate that many non-Ph.D. women are graduate students on assistantships. Apparently a higher proportion of female graduate students responded to our survey than did male graduate students, probably due to sampling techniques and interest in the survey.

Mean salaries for academic men are more than \$14,000 higher than for their female counterparts, a trend that is observed in almost every tenure and educational category. Men also have more post-degree experience than do women--about 5 years more on the average. They also tend to have more publications than women on a per year basis.

Government

Approximately 58 percent of the men in the sample and 48 percent of the female AAEA members in government have a Ph.D. Men with a Ph.D., however, have twice the experience as measured by years since the last degree and average almost \$9,000 more per year in salary than women with a Ph.D. Among government employees without a doctoral degree, the experience and salary differentials are similar. Women in government appear to publish more than men, perhaps indicating an administrative role for more of the men.

Table 2. Distribution of Male Agricultural Economists and Female AAEA Members by Selected Characteristics

Type of Job	Level of Education	Academic Tenure Status	Respondents ^a				Mean Salary		Average Years Since Last Degree		Average Number of Publications per Year	
			Men		Women		Men	Women	Men	Women	Men	Women
Academic	With Ph.D.	Tenure	34	%	8	%	\$38,309	\$32,812	16.0	13.5	1.2	.9
		Tenure Track	16	15.4	7	9.7	29,000	21,071	4.7	4.0	3.1	1.9
		Nontenure Track	5	4.8	3	4.2	25,000	14,167	8.5	2.0	.1	3.5
		Not Applicable	1	1.0	0	0	55,000	0	21.0	0	.3	0
	Without Ph.D.	Tenure	2	1.9	1	1.4	12,500	22,500	2.0	23.0	3.0	.4
		Tenure Track	0	0	1	1.4	0	22,500	0	11.0	0	.6
		Nontenure Track	5	4.8	9	12.5	14,000	9,722	7.0	3.4	.3	.3
		Not Applicable	2	1.9	7	9.7	7,500	8,214	4.0	2.8	.1	.6
		No Response	0	0	1	1.4	0	22,500	0	5.0	0	4.8
Subtotal		65	62.5	37	51.4	31,680	17,212	11.4	6.5	1.2	1.0	
Government	With Ph.D.	14	13.5	11	15.3	40,192	31,136	12.9	6.5	.7	1.4	
	Without Ph.D.	10	9.6	12	16.7	30,000	21,250	13.2	4.9	.4	.6	
Subtotal		24	23.1	23	31.9	35,761	25,978	13.0	5.7	.6	1.1	
Business and Other	With Ph.D.	6	5.8	2	2.8	38,750	28,750	9.5	1.5	.7	.3	
	Without Ph.D.	9	8.7	10	13.9	38,611	15,000	16.6	2.5	.1	1.3	
Subtotal		15	14.4	12	16.7	38,667	17,292	13.7	2.3	.3	1.2	
Total		104	100.0	72	100.0	33,534	20,417	12.1	5.5	.9	1.0	

^aInformation on type of job was not complete for 27 male and 17 female respondents. These data were not included in this table.

Business and Other

The largest disparities in salary and experience are found in the business and other category. Men averaged 13.7 years of experience and \$38,667 per year compared to 2.3 years of experience and \$17,292 in salary for AAEA women, however, there were relatively few respondents in this category. Women in business, as did women in government, reported more publications than men on a per year basis perhaps indicating fewer administrative responsibilities than men.

Summary

A major difference in employment patterns between men and women is the smaller percentage of women employed in academic jobs. While 63 percent of male agricultural economists in our sample are employed by universities and colleges, 51 percent of female AAEA members have academic employment. Correspondingly, a higher proportion of women are employed in state and federal government than are men.

Mean salaries of AAEA women are lower than mean salaries of the men sampled. The average salary for the 104 men with an identifiable current job is \$33,534 compared to a mean salary of \$20,417 for the 72 women for whom data were available. Part of this differential may be explained by the years of experience accumulated by men and women. Men averaged 12.1 years since their last degree received; AAEA women as a group averaged 5.5 years or experience. In addition to less experience, women have a lower level of education than men. Approximately 57 percent of the women do not have a Ph.D. compared to 27 percent of the men. Both men and women average approximately one publication per year.

Factors Contributing to Salary Differentials Between Male and Female Agricultural Economists

The descriptive data in Tables 1 and 2 do not allow a comparison of the salaries of men and women with equivalent backgrounds. Although mean salaries for women are lower than mean salaries for men within each category, it is difficult to determine the role of experience, productivity, and other variables in producing this salary differential.

Accordingly, a model was developed to test for salary differentials between male and female agricultural economists after accounting for education, experience, research productivity, and other variables. The dependent variable in this model is before tax 1980 salary or 1980 net business income, including consulting fees. Independent variables hypothesized to determine the salary of agricultural economists were:

1) Educational background

With Ph.D. = 1, otherwise = 0

2) Research productivity

a) Number of journal articles and professional papers

b) Number of books published

3) Experience

a) Years since the last degree was received

b) Tenure (months) in present job

4) Administrative duties

Administrator = 1, otherwise = 0

5) Employer an academic institution

Academic = 1, otherwise = 0

6) Career interruptions

Number of times unemployed for 6 months or more

7) Consulting

Percent of income derived from consulting

8) Sex

Female = 1, Male = 0

The regression results for the sample of men and women who are members of the AAEA are reported in Table 3. After omitting incomplete responses, 145 observations were analyzed. The coefficients of the variables measuring publications and consulting proved insignificant. The coefficient for sex was significant, however, indicating mean salaries for women are \$3,769 lower than for men, after controlling for the effects of other variables. This salary differential is considerably less than the \$13,000 differential reported in Table 2, indicating about \$9,000 of that differential can be accounted for by variables other than sex.

It is possible that the significant salary differentials between men and women reported in Table 3 relate to differences in job responsibilities not measured by the independent variables. As academics are a more homogeneous group with respect to job descriptions than business or government agricultural economists, a separate regression equation was estimated to test for salary differentials between men and women in academia--the largest employer in the sample.³ The results are reported in Table 4. After omitting incomplete responses, 105 observations were available for analysis. The coefficients of books, career interruptions, and consulting proved insignificant. Again, after controlling for all other variables, academic women had a mean salary \$3,038 lower than that of academic men. This suggests that although much of the salary differentials between academic men and women reported in Table 2 are accounted for by explanatory variables other than sex, a significant salary differential between men and women in academia does exist.

Table 3. Regression Results for All Men and AAEA Women

Variable	Estimated Coefficient
Intercept	18,021.60 (8.83) ^a
Ph.D	9,528.07 (6.17)
Books	3901.38 (1.85)
Publications	61.25 (1.03)
Years Since Degree	379.42 (3.94)
Tenure in Job	103.01 (4.38)
Administrator	6,693.20 (3.07)
Academic	-5,681.62 (3.95)
Career Interruptions	-3,595.11 (1.77)
Consulting	-365.71 (.77)
Sex	-3,768.74 (2.49)
F	30.70
R ²	.695
Number of Observations	145

^aNumbers in parentheses are t-values (absolute value).

Table 4. Regression Results for Men and Women with Academic Employers

Variable	Estimated Coefficient
Intercept	10,104.57 (5.18) ^a
Ph.D.	12,445.83 (7.52)
Books	949.03 (.51)
Publications	113.79 (2.04)
Years Since Degree	438.09 (5.50)
Tenure in Job	53.24 (2.31)
Administrator	6,554.53 (2.34)
Career Interruptions	-1,789.78 (.99)
Consulting	889.46 (.97)
Sex	-3,037.93 (1.99)
F	34.54
R ²	.768
Number of Observations	104

^aNumbers in parentheses are t-values (absolute value).

Although mean salaries of men and women are significantly different after controlling for the independent variables in the model, it should be noted that there are other determinants of salary that are not accounted for in this analysis. For example, sex and regional location could be correlated in such a fashion as to bias the results, but this could not be determined in this study. Another important determinant of salary, quality of work, is not readily quantified and was not available from the survey data. Salary and advancement can also be accelerated by interpersonal skills and rapport with colleagues and administrators, another unmeasurable factor. To completely isolate the effects of sex on salary, all of these factors should be considered.

The significant salary differentials between men and women reported in the models could result from a number of factors. If women in general are less mobile than men, have fewer job alternatives, and/or are less successful salary negotiators than men, salary differentials could result. Because the reasons for significant salary differentials are difficult to determine, it is interesting to note the responses of men and women in the sample on this topic. In response to the question, "Do you think you are paid less or have a lower level job than you would if you were the opposite sex?", approximately 4 percent of the men and 22 percent of the women said yes. A sizeable minority of women perceive salary differentials to exist and believe these differentials to be sex related.

Summary and Conclusions

The survey data analyzed in this paper suggest that female agricultural economists have not yet achieved a rank within the profession equivalent to male agricultural economists. Lower levels of education, a lack of experience, and fewer women academics may be contributing factors. Furthermore, significant salary differentials between men and women exist after accounting for

education, experience, research productivity and other variables. These conclusions are consistent with reports of the rank and salary of women in science and with data on the rank of women economists in academia (Bayer and Astin, Bailey).

The real issue may be the future advancement of women within the profession rather than their current professional status. Although the number of women in the profession is currently small, one encouraging signal is the increasing numbers of female graduate students in agricultural economics. Between 1974 and 1979 the number of women enrolled as full-time graduate students in doctorate departments more than doubled--from 155 to 352. During the same time period, male enrollment increased by only 11 percent from 1,452 to 1,625 (Vetter and Babco).

These data indicate young women are optimistic about a professional future in agricultural economics. If that optimism is justified, the number of women in the profession should continue to increase. Improvements in the rank and status of these women, however, will depend upon advancement equal to that of their male counterparts.

FOOTNOTES

Linda K. Lee is an Assistant Professor of Agricultural Economics at Oklahoma State University. This is Professional Paper No. 1063 of the Oklahoma Agricultural Experiment Station.

¹Letter from Luther Tweeten, President of the AAEA to Committee members, September 2, 1980.

²Twenty-seven men and seventeen women were deleted from the analysis because information on their current job was incomplete.

³Because of the small sample size, all women academics, including non-AAEA members, were included in the model.

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