



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Factors Influencing Salaries of Agricultural Economics Professionals at Land Grant Institutions

Jennie Popp
Department of Agricultural Economics and Agribusiness
University of Arkansas
479-575-2279
jhpopp@uark.edu

Arby Abdula
Department of Agricultural Economics and Agribusiness
University of Arkansas
479-575-2279
jhpopp@uark.edu

Doris Newton
USDA Economic Research Service
(202) 694-5619
dnewton@ers.usda.gov

Dianne Pittman
Department of Agricultural Economics and Agribusiness
University of Arkansas
479-575-2256
pittman@uark.edu

Diana Danforth
Department of Agricultural Economics and Agribusiness
University of Arkansas
479-575-2256
ddanfort@uark.edu

*Selected Paper prepared for presentation at the Southern Agricultural Economics Association
Annual Meeting, Atlanta, Georgia, January 31-February 3, 2009*

Paper Abstract: Research in the mid 1900s suggested that salary gaps existed between men and women in academia. Though the research helped bring attention to salary gaps, less focus was on causes of salary differences. More recent research suggested differences in salaries were based on performance. A survey was sent to agricultural economics professionals at land grant institutions to identify the factors that influence their salaries. Results of the ordered probit model suggest that seven variables can be used to explain salaries: having attained tenure, working at an 1862 institution, the amount of grant dollars, the number of journal articles, highest academic rank and the percentage of appointment that is in administration (positive influences) and importance of family time (negative influence). Other variables tested – gender, ethnicity and other preferences – were not found to influence salary levels.

Introduction

One major area of focus in economics is labor issues. At times that focus has been placed on the laborers within the economics and agricultural economics professions themselves. These studies tend to have one of three foci: 1) identifying factors that influence the decision to become an economics/agricultural economics major, 2) identifying factors that determine the choice of career in academia, private sector, government or other areas, 3) comparing potential salary differences between agricultural economics/ economics professionals or within different subgroups of professionals (such as across gender, ethnicity, rank, etc). The early work on economics professionals suggested that real gaps in salaries did exist between men and women, suggesting a bias against women. However, work beginning in the 1990s countered that those salary gaps have narrowed greatly since the 1980s, once rank, experience and productivity factors have been taken into account. More recent research shows that other factors, such as marital status and number of children can be related to salary, and often the directions of those relationships are different for men and women. The purpose of this research is to 1) collect salary, benefits and other job and career information from agricultural economics professionals at the 1862, 1890 and 1994 land grant institutions and identify the factors that influence salary.

Literature Review

Research covering the salaries and status of professionals, including those in academia dates back to the early 1900s (Table 1). Differences between whites and non-whites had been some of the earliest research. Until mid 19th century, research suggested real differences (up to 40%) in salaries existed between whites and negro/African American teachers (Boykin, 1949). However, more recent research suggests that often those wage differentials are attributed to the lack of experience of a worker, the kind of job they perform and the geographic location of the work assignment (Perloff, 1960). Early studies suggested that differences existed in salaries of equally qualified men and women (Joy, 1990). But recently, studies suggest that it is the lack of women in tenured, full professor rank positions that is the cause of the salary differences (Bellas, 1994; Ginther and Hayes, 1999; Ehrenberg, Pieper and Willis, 1998; Rees, 1993).

Table 1: Summary of Salary Studies by Topic

Topic	Studies
Salary differences between whites and non whites	Boykin, 1949; Editor, 1998; Heckman, Lyons and Todd, 2000;
History and status of African Americans in academia	Gregory, 2001; Holzer, 2000; JBHE, 1998; Jones, Nelson and Parks, 1983; NCES, 2000; Robbins and Evans, 1983; Touchton, 1995;
Salary comparisons between men and women in academia	West, 1995; Bellas, 1994; Bellas, 1997; Khan, 1995; Ginther and Hayes, 1999; Ehrenberg, Pieper and Willis, 1998; Rees, 1993
Salaries and choices of careers	Amatea and Fong, 1991; Cole and Zuckerman, 1984; Hine and Cheney, 2000; Moses, 1989; Teevan, Pepper and Pellizzari, 1992; Zepeda, Marchant and Chang, 1993; Burke, 2000
Salaries & advancement opportunities in economics and agricultural economics	Barrett and Bailey, 1999; Formby, Gunther and Sakano, 1993; Hilmer and Hilmer, 2003; Koplin and Singell, 1996; Lane, S. 1981; Lee, 1981; Marchant and Williamson, 1994; Marchant and Zepeda, 1995; McDowell, Singell and Ziliak, 2001; Siegfried and Stock, 2001;

Some studies have focused on agricultural economics professionals specifically. Work conducted in the 1980s and 1990s (ex., Ahearn, 1989; Jones, Nelson, and Parks, 1983; Marchant and Williamson, 1994; Marchant and Zepeda, 1995) looked at the status of the agricultural

economics profession while some focused on women and African Americans, specifically. In 1998, American Agricultural Economics Association (AAEA) member researchers conducted the first tracking survey of 900 agricultural economics professionals in academia, government. The 494 respondents indicated that marital status, presence of children, gender, ethnicity, and age affects an individual's professional choice. Women and minorities as compared to their male counterparts gave more importance to spousal options and flexible hours (Cheney, 2000; Hine and Cheney 2000). Using this same data set, Thimany (2000) found that salary was significantly correlated with type of position – administrators received higher salaries than those whose primary responsibility was teaching. Salaries were also significantly and positively correlated with years of experience for both men and women. Other analyses showed that teaching and publications were negatively related (significantly for women) which could help explain why salaries were generally lower for women than for men.

While this survey provided some of the first information related to performance and pay for the agricultural economics profession it was limited in the following ways. First, as noted by Thilmany (2000), this study did not control for interdependencies across factors (things that may have been captured in regression analysis) that may better allow researchers to understand the effects of individual factors on salary. Second, as this was the first survey of its kind, it could not provide insights on changes over time. In 2005 a committee was formed within the AAEA subcommittee the Committee for Women in Agricultural Economics (CWAE) in 2005 to revive the survey. The revised survey process and the results are the subject of this paper.

Methods

In Fall 2006, the 1998 survey questionnaire was revised to clarify some questions and remove excess detail. The survey was also broken into two stand-alone versions, one for land

grant (academic) institution professionals and one for government professionals. The academic questionnaire included 66 questions divided into five parts involving: 1) education and professional experiences, 2) employment preferences and factors that can impact job choices, 3) job responsibilities, appointment, tenure, performance and challenges faced in the job, 4) job benefits, and 5) demographic questions.

The survey population included all known agricultural economists (MS or PhD) working in agricultural economics disciplines at 1862 (52 schools), 1890 (18 schools) and 1994 (33 schools) land grant academic institutions in the US. Lists were obtained from requests to Department Heads or through internet searches. A total of 1,658 agricultural economists were identified and surveyed. The survey was delivered via the internet using the Snap Survey Software (UITs, 2007).

Summary statistics were generated for each of the 253 variables included in the survey. Next, chi square tests were used to test for differences in responses by gender regarding: 1) employment institution, 2) highest degree earned, 3) academic rank, 4) marital status, 5) dependents, 6) caregiver responsibilities, 7) US citizenship, 8) ethnicity, 9) age, 10) factors important in choosing their job, and 11) potential problems in their job.

The dependent variable, adjusted salary, was placed into 14 different ordered categories in the survey, starting at *less than \$30,000* and ending at *greater than \$150,000*. An ordered probit model was used to identify factors that influence salary. Based on a review of the literature, salary was estimated as follows:

Salary = f (current employment, highest academic position (rank), years in highest position, tenure, appointment split number of journal articles, other publications, grant dollars, gender, white, child time, family time, and dependents).

Results

Of those surveyed, 333 responded (or 20.08%). Of the respondents, 253 (or almost 76%) were men and 74 were female (6 did not respond to this question). Most (80%) respondents were from 1862 institutions. Over 92% held PhD degrees. Of those in a faculty position, close to 60% were full professors. Respondents were married (85.22%), single (11.64%) and partnered (3.14%). Nearly 17% had children; 60.58% of those respondents shared responsibility with spouses/partners for the children, 7.69% held the responsibility themselves and 31.73% said their spouse had main responsibility. Most (90.88%) respondents were US citizens. Most (87.30%) were white, while 4.67% were Asian, and 3.81% were African American, among others. Respondents varied in ages from mid 20s to over 75 but the largest percentage of respondents were in the 46 to 50 and 51 to 55 year categories. The respondents listed working at 1862s (69.8%), 1890s (6.35%) and government/international organizations (4.76%) as their job choice upon graduation. Of the respondents, 78.19% said their first job was a good or a perfect match to their preferences.

Testing for Differences in Responses between Men and Women

First, tests were run to determine whether significant differences existed in employment locations for men and women. This test was run two ways. First, men and women were compared across all institutions; no significant differences were found. However, when the type of institution was collapsed down into two categories (1862 and not 1862), significant differences ($p=0.0299$) were found as 80% of men were employed at 1862 institutions while only 65% of women were employed there. A significantly ($p=0.0669$) higher percentages of men (93.12%) had Ph.D. degrees compared to women (89.86%).

Respondents were compared by their highest position or rank at the academic institution. It is important to note that only those in assistant professor, associate professor and full professor ranks were compared (45 of the respondents did not fall into these categories). Significant differences ($p = 0.0037$) existed. The majority (52%) of men were full professors where less than 10% of women held this rank. Despite the small differences in the number of women and men with PhD degrees, full professor rank is dominated by men. This may be explained by the longer length of service and greater number of publications men have compared to women which may have contributed to a quicker promotion in rank for men than women.

Significant differences ($p < 0.0001$) also existed in marital status by gender. A greater percent of men (90.27%) were married than women (66.67%). There was no significant difference in the number of dependents between men and women. However, responsibilities for child care were significantly different ($p=0.0003$). A greater percentage of women (19.23%) than men (3.90%) were primarily responsible for the child's care. More men (41.56%) listed their spouse as the primary caregiver than women (3.85% did). Note that over 100 respondents who stated that they had children did not respond to this question. It could be because their children were older and did not require direct care from a parent.

Significant differences were not found in citizenship of respondents. However differences did exist between men and women in white ethnicity ($p=0.0138$) and Asian ethnicity ($p=0.0149$). Significant differences also existed in the age distribution of men and women. Men were generally older than the women.

Comparing Factors Important in Job Choice Between Men and Women

Table 2 shows a comparison of factors that were important in the job choice. This table shows that men and women felt differently about seven factors. A significantly greater

percentage of men responded that good salary, health benefits, and pension were important while a greater percentage of women felt supportive colleagues, tenure opportunity, non-discrimination and opportunities for partners were important.

Table 2 Comparison of Factors Important in Job Choice by Gender (Percent Respondents)

Factor	Male	Female	p Value
Job Responsibilities	91.36	85.29	0.2490
Work Environment	76.23	77.94	0.7602
Location	74.29	72.06	0.2785
Good Salary	73.88	72.06	0.0990
Adequate Resources	72.65	67.65	0.4991
Employer Perception	70.20	73.13	0.8957
Advancement Opportunity	68.16	76.47	0.1892
Health Benefits	63.93	48.53	0.0709
Tenure Opportunity	61.48	76.47	0.0454
Pension	56.79	41.81	0.0248
Family Time	52.65	45.59	0.4713
Supportive Colleagues	50.21	65.67	0.0105
Professional Isolation	49.18	48.53	0.8410
Child Time	40.33	41.18	0.8710
Non-Discrimination	34.71	62.69	0.0002
Social Isolation	33.88	33.82	0.9334
Mentor Availability	29.10	35.82	0.5615
Partner's Opportunities	28.57	63.24	<0.0001
Elder Time	11.48	9.09	0.3538

When ranked in order of greatest importance, men ranked job responsibilities, work environment, location, good salary and adequate resources in the top five whereas women ranked job responsibilities, work environment, tenure opportunities, advancement opportunities, and employer perception as most important. While most men favor factors which are for their personal security and benefits, women generally favor career growth and work benefits.

Comparing Potential Sources of Problems in the Job Between Men and Women

Possible problems that men and women considered in their job were also compared (Table 3). Ten factors were found to be significantly different. In all cases, a greater percentage

of women stated that these were problems. However, no more than 20% of men and 40% of women listed these factors as problems.

Table 3 Comparison of Problem Factors in Job by Gender (Percent Respondents)

Factor	Male	Female	p value
Adequate Resources	19.58	28.36	0.1600
Having time for family	18.18	31.34	0.0372*
Lack of Supportive Colleagues	16.74	31.34	<0.0001*
Negative Work Environment	15.19	25.37	0.0855*
Lack of Mentor	15.13	33.33	<0.0001*
Having time for children	13.69	31.82	0.0008*
Employer Perception Problem	13.33	32.84	0.0010*
Professional Isolation	12.5	39.39	<0.0001*
Partner's Mobility	12.5	34.33	<0.0001*
Social Isolation	6.25	21.21	0.0003*
Lack of Skills	4.56	7.69	0.3196
Discrimination	4.2	20.9	<0.0001*
Having time for elders	3.72	7.81	0.3508
Lack of Health Benefits	1.69	4.55	0.2847
Lack of Pension	0.83	3.03	0.1827

Men listed lack of adequate resources, having time for family, lack of supportive colleagues, negative work environment and lack of mentors as their top five problems in their current job, while women listed professional isolation, partner's mobility, lack of mentor, and perception of employee by employer and time for children as their top five. While discrimination though came out significant, only a small percentage of men and women said it did exist.

To summarize these tests, the null hypotheses of no significant difference between men and women were rejected regarding employment institution (for 1862 vs. all others), highest degree earned, academic rank, marital status, caregiver responsibility, ethnicity(white or Asian), age, 7 important factors in job choice, and 10 potential problems in job. The null hypotheses for significant differences between men and women were not rejected for employment institution (when comparing across 1862, 1890, 1994, and others), number of dependents under 26, US citizenship, 12 important factors in current job choice and 5 important problems in current job.

Factors That Influence Salary – The Ordered Probit Model

As explained in the methods, 13 variables were examined in the ordered probit model. The final model contained 7 of the 13 (Table 4). Note that not all levels of the categorical variables (family time, grant and rank) are significantly different from their baseline lowest level. However, the Likelihood Ratio tests (Table 5) suggest that these variables are still relevant to the and were therefore kept in the final model.

Table 4. Parameter Estimates for Probit Model

Variable	Coefficient	St. Error	b/St.Error	Pr	Mean of X
Constant	-0.700423	0.531792	-1.317	0.1878	
Employed at 1862	0.433609	0.234603	1.848	0.0646	1.898876
Fam Time (2) Somewhat Unimp	-0.588780	0.263744	-2.232	0.0256	0.097378
Fam Time (3) Neutral	0.020868	0.208087	0.1	0.9201	0.217228
Fam Time (4) Somewhat Imp	-0.243665	0.200347	-1.216	0.2239	0.250936
Fam Time (5) Important	-0.629784	0.203102	-3.101	0.0019	0.247191
Grants (2) \$1-\$9,999	-0.058047	0.415640	-0.14	0.8889	0.033708
Grants (3) \$10,000-\$19,999	0.448230	0.416705	1.076	0.2821	0.033708
Grants (4) \$20,000-\$29,999	-1.151832	0.619033	-1.861	0.0628	0.014981
Grants (5) \$30,000-\$39,999	0.107982	0.460873	0.234	0.8148	0.026217
Grants (6) \$40,000-\$49,999	-1.050660	0.431615	-2.434	0.0149	0.033708
Grants (7) \$50,000-\$99,999	-0.300440	0.300442	-1	0.3173	0.127341
Grants (8) \$100,000 - \$199,999	-0.163989	0.286259	-0.573	0.5667	0.183521
Grants (9) \$200,000-\$299,999	0.281739	0.302818	0.93	0.3522	0.116105
Grants (10) \$300,000-\$399,999	-0.241923	0.342114	-0.707	0.4795	0.071161
Grants (11) \$400,000-\$499,999	0.767616	0.361727	2.122	0.0338	0.059925
Grants (12) \$500,000+	0.411281	0.284008	1.448	0.1476	0.217228
Article	0.029031	0.006395	4.54	0	9.325843
Administrative percentage	0.006889	0.003429	2.009	0.0445	8.504370
Rank (4) Assoc Prof	-0.096145	0.265556	-0.362	0.7173	0.198502
Rank (5) Full Prof	0.736557	0.262351	2.808	0.005	0.460674
Rank (6) Administrator	1.064106	0.334190	3.184	0.0015	0.146067
Tenure	0.735716	0.227747	3.23	0.0012	1.749064

These factors positively added to salary level: employment at an 1862, having an administrative component of the appointment split, publishing refereed articles and attaining tenure. The coefficients on the categorical variables represent differences from the lowest categorical value for that variable. For example, the base for family time is the assumption that family time is not important. It is expected that the more importance placed on family time, the lower the salary.

Three of the four coefficients hold a negative sign but they are not increasingly more negative. However, somewhat unimportant and important have similar values which suggest there is not much salary impact difference across most levels of importance placed on family time.

The model suggests that grant dollars actually decrease salaries unless the grant dollar values are very large. This is not an expected result, and as stated, many of the individual coefficients are not significant. When considering academic rank from assistant professor to full time administrator, results are mixed. This model suggests moving from assistant to associate professor would actually result in a decrease in salary but this coefficient is not significant. However, expected positive significant coefficients exist for full professors and administrators.

Table 5. Likelihood Ratio Tests Results

Parameter	Nparm	DF	L-R ChiSquare	Prob>ChiSq
Employment in 1862	1	1	3.415104	0.0646
B9/H9. Family Time Importance	4	4	164.9963	0.0000
Share of grant 5-year total	11	11	144.7080	0.0000
# Articles in Refereed Journals	1	1	20.6116	0.0000
Admn Appointment	1	1	4.036081	0.0445
Highest academic level achieved	3	3	154.1181	0.0000
Tenure vs Non-tenure	1	1	10.4329	0.0012

The threshold parameters associated with each salary level are presented in Table 6. These parameters suggest how each level of each variable can influence the movement from one salary level into another. If an individual was at salary level \$70,000 to \$79,999, attaining tenure would likely move them to into the \$80,000 to \$89,999 level because 0.735716 is more than 0.616288 the threshold level for salary level \$80,000 - \$89,999.

Table 6. Threshold Parameters

Salary Level	Coefficient	St.Er.	b/St.Error	Pr.
Mu (\$80,000 - \$89,999)	0.616288	0.089199	6.909	0.0000
Mu (\$90,000-\$99,999)	1.392560	0.089428	15.572	0.0000
Mu (\$100,000-\$109,999)	2.141577	0.088373	24.233	0.0000
Mu(\$110,000-119,999)	2.445614	0.090393	27.055	0.0000
Mu (\$120,000-\$129,999)	3.014171	0.097809	30.817	0.0000
Mu(\$130,000-\$139,999)	3.196286	0.101962	31.348	0.0000
MU (\$140,000 - \$149,999)	3.586759	0.113229	31.677	0.0000
Mu(150,000+)	3.809718	0.123783	30.777	0.0000

Finally, the marginal effects associated with each variable are presented in Table 7. These values suggest by how much a one unit change in any of the independent variable will change the distribution of individuals within each salary level. For example, for the variable being employed in an 1862 institution, moving from employment from a non-1862 to an 1862 reduces the probability of being in salary levels 1 to 5 and increases the probability of being in salary levels 6 through 10. The same result holds for increases in number of journal articles, increase in percentage of administrative appointment and moving from non-tenure to tenure. The marginal effects for family time, show that in most cases, as one places more importance on family time (with the exception of neutral family time) the probability of moving into a lower salary range increases where as the probability of moving into a higher salary level decreases.

While the coefficients for grant dollars were somewhat unclear, clarity is found in the interpretation of most of their marginal effects. For grant levels of \$0 to \$200,000 (with the exception of the \$10,000-\$19,999) one unit increases in grant dollars increases the probability of being in the \$80,000 to \$99,999 (salary levels 3 and 4) and decreases the probability of being in other ranges. This could mean that individuals in this salary range depend upon grant dollars to supplement their income. However once an individual reaches \$200,000 in grant funds, a one unit increase in grants increases the probability that his income will be at \$100,000 or more.

In terms of academic rank, the marginal impacts associated with moving from assistant professor to associate professor suggested a probability of moving out of higher salary levels and into lower salary levels. However, the marginal effects associated with full professors and administrators shows an expected relationship. As one moves into those positions there is an increase in the likelihood of moving into higher salaries and a decrease in the likelihood of moving into lower salaries.

Table 7. Marginal Effects

Variable	Salary 1	Sal Lev 2	Sal Lev 3	Sal Lev 4	Sal Lev 5	Sal Lev 6	Sal Lev 7	Sal Lev 8	Sal Lev 9
Employed at 1862	-0.0238	-0.0434	-0.0774	-0.0264	0.015	0.0535	0.0188	0.0352	0.0153
Fam Time (2) Somewhat Unimp	0.052	0.0715	0.0938	-0.0021	-0.0317	-0.0765	-0.0228	-0.039	-0.0156
Fam Time (3) Neutral	-0.0011	-0.0021	-0.0037	-0.0013	0.0007	0.0026	0.0009	0.0017	0.0007
Fam Time (4) Somewhat Imp	0.0152	0.0259	0.0429	0.0109	-0.0099	-0.0309	-0.0104	-0.0189	-0.008
Fam Time (5) Important	0.0487	0.0722	0.1042	0.0108	-0.03	-0.0803	-0.0253	-0.0447	-0.0185
Grants (2) \$1-\$9,999	0.0034	0.006	0.0103	0.0031	-0.0022	-0.0073	-0.0025	-0.0046	-0.002
Grants (3) \$10,000-\$19,999	-0.0164	-0.0353	-0.077	-0.0483	0.0049	0.0441	0.0192	0.04	0.0193
Grants (4) \$20,000-\$29,999	0.1736	0.1496	0.1119	-0.0874	-0.0727	-0.1332	-0.034	-0.0537	-0.0198
Grants (5) \$30,000-\$39,999	-0.0054	-0.0102	-0.0193	-0.008	0.0032	0.0128	0.0047	0.0091	0.004
Grants (6) \$40,000-\$49,999	0.1432	0.1371	0.1181	-0.0662	-0.0656	-0.1259	-0.033	-0.053	-0.0199
Grants (7) \$50,000-\$99,999	0.0207	0.0334	0.0521	0.0092	-0.0136	-0.0388	-0.0125	-0.0224	-0.0093
Grants (8) \$100,000-\$199,999	0.01	0.0173	0.029	0.0077	-0.0065	-0.0208	-0.007	-0.0128	-0.0055
Grants (9) \$200,000-\$299,999	-0.0126	-0.025	-0.0498	-0.0245	0.0064	0.0316	0.0123	0.0243	0.0111
Grants (10) \$300,000-\$399,999	0.0164	0.0267	0.0421	0.008	-0.0108	-0.0313	-0.0101	-0.0182	-0.0076
Grants (11) \$400,000-\$499,999	-0.0226	-0.0514	-0.123	-0.097	-0.003	0.058	0.0301	0.0682	0.0355
Grants (12) \$500,000+	-0.0182	-0.0362	-0.0722	-0.0362	0.0088	0.0454	0.0178	0.0354	0.0163
Article	-0.0016	-0.0029	-0.0052	-0.0018	0.001	0.0036	0.0013	0.0024	0.001
Administrative percentage	-0.0004	-0.0007	-0.0012	-0.0004	0.0002	0.0009	0.0003	0.0006	0.0002
Rank (4) Assoc Prof	0.0056	0.0099	0.0171	0.0051	-0.0036	-0.0121	-0.0041	-0.0077	-0.0033
Rank (5) Full Prof	-0.0408	-0.0712	-0.126	-0.0472	0.0218	0.0844	0.0308	0.0594	0.0267
Rank (6) Administrator	-0.0313	-0.0688	-0.1628	-0.133	-0.0082	0.0691	0.0386	0.0905	0.0488
Tenure	-0.0404	-0.0737	-0.1313	-0.0448	0.0255	0.0908	0.0319	0.0598	0.026

Conclusion

For decades, labor issues have been a focus of study in the economics and agricultural economics disciplines. Early studies suggested that differences in salaries existed between men and women as well as between non- minorities and minorities. More recent research suggested that those differences disappear when performance measures are taken into consideration.

This study supports results of those more recent works. This study suggests that salaries are influenced by performance factors such as grant dollars earned, articles in peer reviewed journals, having achieved tenure, and rank. The type of academic institution where employed also influenced salary as well as the importance of family time in choosing a job.

Gender and race (White and Asian), came out significant only when they were tested individually. But when other factors (as mentioned above) were included in the analysis, gender and race do not impact salary changes.

This study is a revival of the AAEA Tracking Survey that is (hopefully) to be administered through the Committee for Women in Agricultural Economics every three to five years. This study has provided a methodology to track agricultural economics professional in academia (as well as government) over time to study potential changes in career choices, performance and salary.

This study too however must acknowledge limitations. First, further improvements could be made in the survey instrument itself to better update top end salary values and grant share values. Tradeoffs exist when asking a respondent to give an exact salary figure vs. selecting the appropriate range. The same applies to grant dollars. However the difficulties in model estimate and potential error when using ranges may outweigh the benefits of potential increased response rate when asking for a range only.

Second, researchers were dependent upon university websites in most cases to develop the list of agricultural economics professionals at Land Grant Institutions. This was a timely process and is only as good as the upkeep of the individual websites. Researchers likely missed newer faculty and included retired faculty because websites were not up to date.

Third, the total population was limited to the identified government and academic institutions only excluding private organization and those self-employed. There were only few respondents identified from 1994 institutions; this is because there are only few of them and contact information is hard to find. As this study was conducted over the web, only those with active email addresses could be included in the study.

Since gender and race appears to not affect salary of the professionals, an in depth study on the academic factors that the professionals believe to affect their salary and promotion should be given emphasis in future studies. It would also be interesting to know how the proportion of women employee or minority hired by university changes overtime and see if indeed there is a change as far as proportion of women and men in the organization. A study on the women and their reasons for choosing job in smaller institutions is also one concern that can be studied further. In this study at some point, discrimination was a problem to some men and women only and was not even within the top 5 problems which they think affects their current job, a follow up study on this to evaluate when a discrimination exist in their organization if there's any.

References

- Ahearn, Mary. 1989. "Characteristics of Agricultural Economists and the Determinants of Salary Levels" CWAE newsletter, American Agricultural Economics Association, Winter 1988-89.
- Amatea E. and Fong, M. 1991. "The Impact of Role Stressors and Personal Resources on the Stress Experience of Professional Women." *Psychology of Women Quarterly* 16: 419-30.
- Barrett, C. and D. Bailey. 1999. "Are Agricultural Experiment Station Faculty Salaries Competitively or Monopolistically Determined?" *Agriculture Resource Economics Review* 28:1-10.
- Bellas, M. Comparable Worth in Academia: "The Effects on Faculty Salaries of the Sex Composition and Labor Market Conditions of Academic Disciplines." *American Sociological Review* 6(1994) 807-821.
- Bellas, M.L. 1997. "Disciplinary Differences in Faculty Salaries: Does Gender Bias Play a Role?" *The Journal of Higher Education*, 68(3): 299-321.
- Boykin, L.L. 1949. "The Status and Trends of Differences between White and Negro Teachers' Salaries in the States". *The journal of Negro education* 18(1): 40-47.
- Burke, B. 2000. 'Karl Marx and informal education', *The Encyclopaedia of Informal Education*, www.infed.org/thinkers/et-marx.htm. Last update: April 11, 2008
- Cheney, L.M. 2000. "Tracking Agricultural Economics Professionals." *Review of Agricultural Economics* 22(1):17-22.
- Cole, J. and H. Zuckerman. "The Productivity Puzzle: Persistence and Change in the Patterns of Publications on Men and Women Scientists." In: P. Maehr and M.W. Steinkamp (eds) *Advances in Motivation and Achievement*. Greenwich, CT, JAI Press, pp217-256.
- Editor. 1998. "Do Black Professors Earn More than White Professors?" *The Journal of Blacks in Higher Education* 19:48-49.
- Ehrenberg, R., P. Pieper, and R. Willis. 1998. "Do Economics Departments with Lower Tenure Probabilities Pay Higher Faculty Salaries?" *The Review of Economics and Statistics* 80(3) 503-512.
- Formby, J.P. W.D. Ginther, and R. Sakan. 1993. "Entry Level Salaries Of Academic Economists: Do Gender or Age Matter?." *Economic Inquiry* 31:128-138
- Ginther, D.K., and K. Hayes. 1999. "Differences in Salary and Promotion in the Humanities." *The American Economic Review* 89(2): 397-402.

- Gregory, S.T. 2001. "Faculty Women in the Academy: History, Status and Future." *The Journal of Negro Education* 70(3):124-138.
- Heckman, J., T. Lyons, and P. Todd. 2000. "Understanding Black White Wage Differentials 1960-1990." *The American Economics Review* 90:344-49
- Hilmer, C.E. and M.J. Hilmer. 2003. "A Descriptive and Econometric Analysis of Annual Salaries, Gender, Experience and Peer-Reviewed Publication Histories within Top Ranked Agricultural Economics Programs. *Selected Paper for the American Agricultural Economics Association Annual Meeting*, Montreal, Canada, 27-30 July. 39pp.
- Hine, S. and L. Cheney. 2000. "Career Choices and Challenges among Agricultural Economists." *Review of Agricultural Economics* 22: 34-41.
- Holzer, H.J. 2000. Racial Differences in Labor Market Outcomes among Men...America Becoming: Racial Trends and Their Consequences Vol. 2. [Http://www.nap.edu/openbook/0309068401/html/98.html](http://www.nap.edu/openbook/0309068401/html/98.html).
- Jones, D., N. Nelson, and A. Parks. 1983. "Demand and Supply Factors for Black Agricultural Economists." *American Journal of Agricultural Economics* 65 988-992.
- Joy, L. 2000. "Do Challenges Shortchange Women? Gender Differences in the Transition from College to Work." *The American Economic Review* 90: 471-475.
- Koplin, Van W. and L. Singell, Jr. 1996. "The Gender Composition And Scholarly Performance Of Economics Departments: A Test For Employment Discrimination." *Industrial and Labor Relations Review* 49(3) 408-423
- Lane, S. 1981. "Evidence of Barriers to the Parallel Achievement to Male and Female Agricultural Economist." *American Journal of Agricultural Economics* 63:1025-1031.
- Lee, L. 1981. "A Comparison Of The Rank And Salary Of Male And Female Agricultural Economists." *American Journal of Agricultural Economics* 81(5):1013-1018.
- Marchant, M., and H. Williamson, Jr. 1994. *Achieving Diversity: The Status and Progress of Women and African Americans in the Agricultural Economics Profession*. New York: Garland Publishing.
- Marchant, M. and L. Zepeda. 1995. "The Agricultural Economics Profession At The Crossroads: Survey Results Of Faculty Salary Employment And Hiring Prospects" . *American Journal of Agricultural Economics* 77(5):1322-28.
- McDowell, J, M.L. Singell, and J. Ziliak. 2001. "Gender and Promotion in the Economics Profession." *Industrial and Labor Relations Review* 54(2):224-244.
- Moses, Y. 1989. "Black Women in Academe: Issues and Strategies." *Report of the Project in the Status of Education of Women*. Washington DC, Association of American Colleges.

- National Center for Education Statistics. *Salary, Promotion, and Tenure Statistics of Minority Faculty and Women Faculty in US Colleges and Universities*. Washington DC (2000) US Department of Education.
- Rees, A. 1993. "The Salaries of Ph.D.'s in Academe and Elsewhere". *The Journal of Economic Perspectives* 7(1):151-158.
- Robbins, R.D. and S. Evans. 1983. "Characteristics of Black Agricultural Economists." *American Journal of Agricultural Economics* 65: 993-998.
- Schultz, T.W. 1962. "Reflection on Investment In the Man". *Journal of Political Economics* 70(5):1-8.
- Siegfried, J., and W. Stock. 1999. "The Labor Market for New Ph.D. Economists." *The Journal of Economic Perspectives* 13: 115-134
- Teevan, S., S. Pepper, and J. Pellizzari. 1992. "Academic Employment Decisions and Gender." *Research in Higher Education* 31: 141-159
- Thilmany, D. 2000. "Gender Based Differences of Performance and Pay among Agricultural Economics Faculty." *Review of Agricultural Economics* 22(1):23-33.
- Touchton, J. 1995. "Women Presidents in U.S. Colleges and Universities: A 1995 Higher Education Update." Washington DC, American Council on Education.
- West, M. 1995. "Women Faculty: Frozen in Time." *Academe* 87(4):26-29.
- Zepeda, L. M, Marchant, and H.S. Chang. 1993. "The Status of Women Agricultural Economists in Academia." *Review of Agricultural Economics* 15(3) 537-45.