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**Factors Influencing Salaries of Agricultural Economics Professionals  
in Federal Employment – Part I**

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

**Paper Abstract:** Since the early 1900s much research has been conducted on salary gaps between men and women in different professions. While some of that work has focused on agricultural economics professionals, little research could be found specifically relating to agricultural economic professionals in federal employment. A survey was sent to known agricultural economics professionals within USDA. The data from this survey are being used for two purposes. The first is to determine whether differences exist between men and women (and between employees in different agencies) in factors that influence job choice and potential problems in the workplace. The second is to identify factors that influence salaries of men and women agricultural economics professionals in federal employment. This paper addresses the first purpose.

### **Introduction**

In the early 1990s there was a revival of interest by agricultural economics professionals in examining factors that influence individuals' job choice and factors that may influence salary. The early work on economics professionals suggested that real gaps in salaries did exist between men and women for economics professionals, suggesting a bias against women in the economics professions. But the 1990s research suggested that salary gaps narrow greatly once experience and productivity factors have been taken into account. These studies offered new insights into the factors that influence both salary and job choice within the profession as a whole. However, to date very little research is available that focuses specifically on agricultural economics professionals in federal employment. The purpose of this research is two-fold: 1) to determine whether differences exist between men and women (and between agricultural economics professionals in different government agencies) in factors that influence job choice and potential problems in the workplace, and 2) to identify factors that influence salaries of men and women agricultural economics professionals in federal employment. This paper addresses the first purpose.

## **Literature Review**

### Salary and Performance Studies

Since the early 1900s, research across a multitude of disciplines has focused on the salary and status of professionals. A summary of that research can be found in Popp et al. 2009. Early studies suggested that gaps existed in salaries of men and women. But more recent work has shown that other factors, including productivity on the job and job position, are much better indicators of salaries.

Much of the work on salary and gender issues within the last twenty years has been conducted within the agricultural economics profession. Early work conducted by Ahearn (1988) Marchant and Williamson (1994) and Marchant and Zepeda (1995), among others, examined the status of the agricultural economics profession. The American Agricultural Economics Association Employment Services Committee (AAEA ESC) also conducted surveys from 1988-1996. However these data were only collected for agricultural economics departments, not for agricultural economics professionals employed by government or by private industry.

In the late 1990s, three American Agricultural Economics Association subcommittees – the Committee on Women in Agricultural Economics (CWAE), the Committee on the Opportunities and Status of Blacks in Agricultural Economics (COSBAE) and the ESC – collaborated on a project to develop an agricultural economics professionals tracking system. The purpose of this tracking system was to identify the factors that influence agricultural economics professionals' job choices, factors that influence salary and to track the professionals and these factors over time.

The first AAEA tracking survey was conducted in 1998 and the initial sample consisted of nearly 900 male and female members of the AAEA. The sample included white men, women

and minorities who are identified members of the AAEA living in the US and Canada. There were 494 useable survey responses.

Research found that marital status, presence of children, gender, ethnicity, age, and number of children affects an individual's professional choice. A positive work environment and good career match were preferred by the majority of respondents when choosing employment opportunities. Minorities on other hand prefer higher family leave policy, resources available, and salary. . Also women and minorities as compared to their male counterparts give more importance to spouse option and flexible hours (Hine and Cheney 2000). Thilmany (2000) reported that salary was significantly correlated with type of position – administrators received higher salaries than those whose primary responsibility was teaching. (Correlations between salary and research appointment or extension appointment were not significant.) 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.

In 2000, CWAE again attempted a survey of agricultural economics professionals that would track those surveyed in 1998 two years later. However, methodological difficulties occurred and it was not possible to track responses from individuals in the two surveys. The results of that second study were not published.

In 2005, CWAE formed a committee to revive the tracking survey. Given the lack of available research on the status of agricultural economics professionals within government, the committee decided to revise the survey to specifically address choices, performance and salary of government and academic professionals separately as well as for the profession as a whole. While the survey and some of the goals of the research were revised the main hypothesis stayed

the same. That is performance, not gender nor ethnicity, was expected to be predictive of salary. The survey took place in 2007. The surveying process will be explained in the methods section.

Results from the academic portion of the survey respondents have already been analyzed (Abdula, 2008; Popp et al. 2009). Researchers found that a significantly greater percent of men 1) worked at 1862 institutions, 2) had PhDs, 3) were full professors, 4) were white, 5) were married, 6) and said their spouse was responsible for childcare. They also found that a significantly greater percentage of men believed that good salary, health benefits, and pension were important when choosing their job while a greater percentage of women felt supportive colleagues, tenure opportunity, non-discrimination and opportunities for partners were important. Possible problems that men and women considered in their job were also compared (Table 3). A significant difference was also found in ten potential problems that could be faced in the workplace. In all cases, a greater percentage of women stated that these were problems but it is important to note that no problem was experienced by more than 20% of men and 40% of women. Finally researchers examined the factors that could influence salaries of academic agricultural economics professionals. As expected, neither race nor gender was found to be a significant factor. Instead, employment location (1862 institutions), academic rank, tenure, administrative appointments, number of refereed articles, amount of grant dollars and importance of family time in choosing the job were significant indicators of salary.

#### Agricultural Economics Professionals in Federal Employment

The US Office of Personnel Management (OPM) has an interactive information systems database that can be used for statistical analyses of Federal personnel management programs. The OPM's Workforce Information and Planning Group provides statistical information about the Federal civilian workforce via FedScope, an online database analysis tool that allows access

to OPM's Central Personnel Data File (CPDF). FedScope (OPM, 2007) was launched in the fall of 2000 and includes 5 years of employment and other workforce data including: 1) employee gender, age group and length of service group, 2) occupation, pay plan and grade, salary and type of appointment, 3) agency and location of employment, and 4) total number employed by category. The data<sup>1</sup> can be used to analyze statistics on federal personnel employed in the general schedule pay series, GS-110- Economist during the 3<sup>rd</sup> quarter of 2007, the time during which the CWAE government tracking survey was conducted.

According to FedScope, as of September 2007, 4,281 civilians were employed nationwide in the GS-0110 Economist series. USDA employed approximately 12.29% (or 526) of all government economists as of the third quarter of 2007. It is important to note that there are limitations to use of FedScope data. For instance, while most all agricultural economics professionals are classified as GS-0110 series, others may be classified in another series based on a change in their current job title or responsibilities. For example, according to the data set, no GS-0110 were employed at CSREES during the time period, so while these are the best data available they under represent agricultural economists at USDA. These data may under representative of all occupational groups. The USDA Economic Research Service (ERS) agency was the largest employer of USDA personnel (212) in the GS-110 economist series, over 40 percent. The average length of service was 18 years, though most common ranges were 5 to 9 years, 15 to 19 years and 25 to 29 years. The majority of individuals fell into the 50 to 54 year old range. The average salary of a USDA economist was approximately \$101,600 for the time

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<sup>1</sup> Limitations apply to use of FedScope to analyze CPDF data and are indicated in the data definitions. For example, CPDF data is an information system to support statistical analyses of Federal personnel management programs and is not intended to be a Government wide personnel accounting system. A full list of exclusions can be found at the FedScope website <http://www.fedscope.opm.gov/datadefn/acpdf.asp>.

period (includes locality pay); salaries of ERS employees were slightly higher at \$111,063. These data will be compared to the survey respondents to determine how representative our survey respondent group is to the pool of GS-0110 economists.

## **Methods**

The survey revision process began in Fall 2006. The survey was also broken into two stand-alone versions, one for land grant (academic) institution professionals and one for government professionals. The government questionnaire included 55 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, 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 at USDA Economic Research Service. Others were included who were part of a broader USDA department-wide list serve. Lists were obtained through internet searches. A total of 543 agricultural economists in federal employment 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 238 variables included in the survey. Chi square tests were used to test for differences in responses by gender regarding 1) highest degree earned, 2) employment agency, 3) marital status, 4) dependents, 5) caregiver responsibilities, 6) age, 7) salary, 8) factors important in choosing their job, and 9) potential problems in their job. Finally, similar chi square tests were run to determine if there were significant differences in responses to these questions between ERS and other government employees. (In the coming weeks, results from the chi square tests will be used to inform the



development of an ordered probit model that will be used to identify the factors that influence salary for agricultural economics in government employment.)

## **Results**

Of those surveyed, 87 responded (or 16.02%). Of the 87 respondents, almost 75% were men and 25% were female (3 did not respond to this question). Nearly 70% held PhD degrees. Nearly half (49.42%) worked for ERS; the rest were employed across a number of USDA agencies. When asked for their highest position held in government, 7 (8.86%) listed program analyst, 39 (49.37%) listed researcher, 23 (29.11%) listed middle management and 10 (12.66%) listed executive. Ten did not respond to that question.

Respondents listed themselves as married (85%) and single (15%). Nearly 23% had children of dependent age; 42.86% of those, respondents shared responsibility for the children, 14.29% held the responsibility themselves, 33.33% said their spouse had main responsibility and 9.52% said the responsibility rested with someone else.

Most (89.77%) were white, while 4.55% were Asian, and 3.41% were African American, among others. Respondents varied in ages from mid twenties to over 75 but the largest percentage of respondents were in the 51 to 55 year (25%) and 56 to 60 year (19.32%) categories. In listing their job preferences upon receiving their highest degree, 51.22% listed government as their first choice, 28.05% listed government employment as their second choice and 20.73% listed government as their third choice. Of the respondents, 42.70% said their first job was a good or a perfect match to their preferences.

### Testing for Differences in Responses between Men and Women

There was no significant difference ( $p=0.3777$ ) between the percent of men (46.03%) and women (57.14%) employed at ERS vs other government agencies. Nor did significant differences exist in the percent of men (69.84%) and women (76.19%) with PhDs.

Significant differences ( $p = 0.0181$ ) existed in marital status by gender. A greater percent of men (91.80%) were married than women (71.43%). There was no significant difference ( $p=0.6988$ ) in the number of dependents between men and women. However, responsibilities for child care were significantly different ( $p=0.0101$ ). A greater percentage of women (25.00%) than men (6.25%) were primarily responsible for the child's care. More men (43.75%) listed their spouse as the primary caregiver than women (0.00%) did. Note that over 30% of respondents with children did not respond to this question. It could be because their children were older and did not require direct care from a parent.

No significant differences ( $p=0.4789$ ) existed in the age distribution of men and women. Finally, salary was found to be significantly different ( $p= 0.0372$ ) between men and women. More than 76% of women made less than \$110,000 while only 56% of men made less than \$110,000. Part two of the research will seek determine if real differences do exist in salaries of men and women or as was found in the study of agricultural economics professionals in academia, that other factors are the underlying causes of these differences.

### *Comparing Factors Important in Job Choice Between Men and Women*

Table 1 shows a comparison of factors that were important in the job choice. This table shows that men and women felt differently about only two factors. A significantly greater percentage of men responded that location of the job was important while a greater percentage of women, nearly double that of the men, felt that non-discrimination in the workplace was important in choosing their job.

**Table 1 Comparison of Factors Important in Job Choice by Gender (Percent Respondents)**

Factor	Male	Female	p Value
Job Responsibilities	90.48	85.71	0.1229
Good Salary	83.87	85.71	0.8166
Work Environment	79.36	80.95	0.6570
Health Benefits	77.42	66.67	0.4973
Location	70.97	57.14	0.0094
Pension	70.97	52.38	0.1213
Adequate Resources	69.35	61.91	0.2357
Employer Perception	68.26	66.67	0.2133
Advancement Opportunity	67.74	61.90	0.4253
Professional Isolation	45.90	47.62	0.7599
Supportive Colleagues	45.16	57.15	0.8441
Child Time	45.16	47.62	0.4335
Social Isolation	45.16	47.62	0.6548
Partner's Opportunities	32.26	61.90	0.1519
Non-Discrimination	30.65	61.91	0.0020
Mentor Availability	16.39	33.33	0.3632
Family Time	5.00	15.00	0.1650
Elder Time	11.48	9.09	0.3538

When ranked in order of greatest importance, men and women ranked the top four factors in the same order: job responsibilities, good salary, work environment, and health benefits. Men then ranked location as important while women ranked employer's perception of their potential.

### *Comparing Factors That Pose Problems on the Job between Men and Women*

Possible problems that men and women considered in their job were also compared (Table 2). Only two factors were found to be significantly different. A greater percentage of men than women felt that a negative work environment was currently a problem in their job. A greater percentage of women felt that the lack of an adequate pension was a problem in their current job. However, it is important to note that the percentage of respondents who felt that these factors were issues in their workplaces was very small; in all cases no more than 20% of men and 24% of women indicated problems.

**Table 2 Comparison of Problem Factors in Job by Gender (Percent Respondents)**

Factor	Male	Female	p Value
Neg. Work Environment	20.00	9.52	0.0063
Lack of Mentors	18.34	19.04	0.3895
Employer Poor Perception	16.67	38.10	0.1132
Lack of Supp. Colleagues	15.25	9.52	0.6018
Lack of Child Time	15.01	14.28	0.9587
Lack of Family Time	14.76	9.52	0.7284
Lack of Partner's Opp.	14.76	14.28	0.3637
Lack of Resources	8.33	19.05	0.3333
Professional Isolation	7.41	19.05	0.7067
Lack of Skills	5.08	4.76	0.3659
Discrimination	5.00	23.81	0.0845
Social Isolation	3.34	5.26	0.3167
Lack of Adequate Health Benefits	1.67	9.52	0.1715
Lack of Adequate Pension	1.67	9.52	0.0549

The ranking of top problems reported by men and women differed; only two factors were the same for both but were ranked differently. The top five problems reported by men were (in order) a negative work environment, lack of mentors, poor perceptions by their employers of their potential, lack of supportive colleagues and lack of time to care for children. Women most often reported employers' poor perception of their potential, discrimination, lack of adequate resources, professional isolation and lack of mentors. It is interesting to note that nearly 62% of

women said non-discrimination was an important reason for why they chose their job but 23% of women reported discrimination as a problem in their work.

To summarize, the null hypotheses of no significant difference between men and women were rejected regarding marital status and childcare responsibilities. The null hypotheses for significant differences between men and women were not rejected for employment institution, highest degree and having dependents. Null hypotheses are rejected for two factors – location and non-discrimination – that are important in choosing their job. Null hypotheses of no significant differences are also rejected for two factors – negative work environment and lack of adequate pension – that are potential problems in the workplace.

#### Testing for Differences in Responses of ERS and Other Government Employees

Similar chi square analyses were conducted between ERS and non-ERS employees. Significant differences ( $p=0.0026$ ) exist in the percent of ERS employees (86.05%) and non-ERS employees (56.82%) with Ph.Ds. No significant differences ( $p=0.1813$ ) existed in marital status by employment. There was no significant difference ( $p=0.7299$ ) in the number of dependents between men and women; nor was there a significant difference ( $p=0.5570$ ) in caregiver responsibilities. No significant differences ( $p=0.5020$ ) also existed in the age distribution of men and women. Finally, even though highest degree is different between employees at ERS and other agencies, salary was not found to be significantly different ( $p= 0.4089$ ).

#### *Comparing Factors Important in Job Choice Between ERS and Non-ERS Employees*

Table 3 shows a comparison of factors that were important in the job choice for ERS and non-ERS employees. This table shows that ERS and non-ERS agricultural economists felt

differently about five factors. In all cases a significantly greater percentage of ERS agricultural economists suggested that adequate resources, avoiding social isolation, avoiding professional isolation, non-discrimination, and partners opportunities were all important in choosing their job.

**Table 3 Factors Important in Job Choice (by Employer, Percent Respondents)**

Factor	ERS	Non-ERS	p Value
Job Responsibilities	92.86	86.36	0.6858
Work Environment	88.09	70.46	0.2256
Good Salary	80.49	86.36	0.2881
Adequate Resources	78.57	55.82	0.0785
Health Benefits	78.57	67.44	0.3259
Employer Perception	76.19	59.09	0.2201
Location	73.17	63.64	0.3528
Pension	69.04	60.46	0.2488
Advancement Opportunity	68.29	61.36	0.2566
Social Isolation	64.28	27.90	0.0008
Professional Isolation	61.91	30.95	0.0304
Non-Discrimination	52.38	25.58	0.0456
Supportive Colleagues	50.00	44.19	0.6313
Partner's Opportunities	50.00	27.90	0.0675
Family Time	46.78	55.82	0.8136
Child Time	45.24	44.19	0.6208
Mentor Availability	26.83	13.96	0.6086

When ranked in order of greatest importance, ERS and non-ERS agricultural economists both listed job responsibilities, good salaries, work environment and health benefits among their top five important factors; however these factors were ordered differently between the two groups of respondents. Furthermore, ERS included adequate resources among their top five factors while non-ERS economists included location.

#### *Comparing Factors That Pose Problems on the Job between ERS and Non-ERS Economists*

Possible problems that agricultural economists at ERS and other agencies considered in their job were also compared (Table 4). No factors were found to be significantly different.

The ranking of top problems reported by ERS and non-ERS employees, however, differed. Lack of family time and lack of partner's opportunities were the top two factors ranked by ERS employees; these factors did not make the top five of employees of other agencies. Meanwhile, non-ERS employees included negative work environment and lack of supportive colleagues in their top five while ERS agricultural economists did not. The two groups shared three of the top five factors: lack of mentors, employers' poor perception of their potential and lack of child time. It is important to note that none of the factors were listed as problems by more than 17% of ERS agricultural economists or 33% of non-ERS agricultural economists.

**Table 4 Comparison of Problem Factors in Job by Gender (Percent Respondents)**

Factor	Male	Female	p Value
Neg. Work Environment	20.00	9.52	0.0063
Lack of Mentors	18.34	19.04	0.3895
Employer Poor Perception	16.67	38.10	0.1132
Lack of Supp. Colleagues	15.25	9.52	0.6018
Lack of Child Time	15.01	14.28	0.9587
Lack of Family Time	14.76	9.52	0.7284
Lack of Partner's Opp.	14.76	14.28	0.3637
Lack of Resources	8.33	19.05	0.3333
Professional Isolation	7.41	19.05	0.7067
Lack of Skills	5.08	4.76	0.3659
Discrimination	5.00	23.81	0.0845
Social Isolation	3.34	5.26	0.3167
Lack of Adequate Health Benefits	1.67	9.52	0.1715
Lack of Adequate Pension	1.67	9.52	0.0549

### Conclusion

In the past 20 years, agricultural economics professionals have focused some research on salary, performance and preferences within the profession. The completed studies suggest that differences can (and do) exist in characteristics of men and women in the profession, their preferences in choosing a job, and the problems they can face in their job. However, research

also shows that salary is not influenced by gender, but by performance and preference factors instead.

The body of research is growing, but thus far is limited in a focus on agricultural economics professionals within the federal employment system. This study attempts to help fill that void by identifying important choice and problem factors for men and women and both ERS and non-ERS agricultural economists in federal employment. It also highlights important characteristics of federal employees within the profession. In the upcoming weeks, additional studies will be conducted to identify factors that influence the salaries of agricultural economics in Federal employment. It is expected, as found in other studies, that performance, experience and preferences will be influential in salaries.

However, it is important to note that this study is not without limitations. As noted by Abdula (2008) and Popp et al. (2009), as our profession evolves, further improvements are needed in the survey instrument itself to better capture salary, performance and preferences of professionals. Second the population of agricultural economics professionals included in this research was limited to ERS employees and individuals who participated in a USDA list-serv. Efforts are needed to extend that reach to all agricultural economics employed throughout all of the USDA agencies.



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