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Factors Affecting Earnings of Southern Illinois University Agribusiness Economics Graduates: The Non-Land-Grant Experience

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Factors Affecting Earnings of Southern Illinois University Agribusiness Economics Graduates: The Non-Land-Grant Experience

Kim Harris and Nick Kuhns

Abstract: Survey data were used to identify determinants of starting and current salaries of agribusiness economics graduates from Southern Illinois University Carbondale from 1977 to 2001. Labor markets appear to be similar for graduates from land grant and non-land-grant universities. Factors such as advanced degree(s) earned, job location, GPA, job mobility, gender, and whether a student was a native (i.e., four-year student) or transferred from a community college were found to significantly influence earnings. Those with the highest earnings were "native" men with advanced degrees who moved out of the southern Illinois region and were working in the private sector.

Key words: agricultural economics, agribusiness economics, determinants of earnings, labor markets, non-land-grant university.

Research has been done in the past to determine earnings of agricultural graduates from land grant universities, Barkley and Barkley et al at Kansas State University, Broder and DePrey at the University of Georgia, and Preston, Broder, and Almero at Virginia Polytechnic Institute and State University (VPI). It is also important to study the labor markets for non-land-grant alumni.

This study systematically analyzes the extent to which individual characteristics, educational backgrounds, and occupational experiences influence the earnings of bachelor and master's alumni in the Department of Agribusiness Economics (ABE) at Southern Illinois University Carbondale (SIUC), a non-land-grant university with a campus enrollment of approximately 18,000 students. Of particular interest is whether the labor market is different for graduates from agricultural programs at non-land-grant institutions, specifically alumni of the ABE Department, compared to agricultural graduates at land grant universities.

Survey Design and Data

The data needed to analyze the determinants of starting and current earnings of ABE alumni were collected from a survey that was sent to a sample of 270 ABE alumni who received their bachelor's or master's degrees during the years 1977 to 2001. Surveyed individuals had been out of school for one to twenty-five years. The sample size was determined using a method developed by Esseks and Kraft. The starting year of 1977 was chosen because 1977 was the year the ABE Department was created. The mailing

list came from the SIUC Alumni database and included all 835 domestic graduates who earned a Bachelor's of Science Degree with a major in Agribusiness Economics.

The first mailing was sent January 3, 2002. It consisted of a cover letter, a fixed-response questionnaire, and a business reply by mail envelope for returning the questionnaire. One week later the initial mailing was followed with a postcard reminder. Two weeks later any remaining non-respondents were sent another cover letter and questionnaire. A total of 270 surveys were mailed. One hundred and seventy-one were returned, a 63% response rate. One hundred and thirty-seven (50.7%) of the surveys returned were used to estimate the starting salary model and 130 (48.1%) were used to estimate the current salary model.

The questionnaire asked questions about age, gender, job position, annual salary, number of jobs held, degrees earned, work experience, geographic location, grade point average, rural/urban background, and formal education. This information was used to determine what factors influence annual earnings of ABE graduates. Unlike previous research, salary information for both starting and current salaries was actual salaries, not approximations of actual salaries. As in previous studies, non-respondent bias may be present and limits the ability to generalize sample data to the general population (Broder and DePrey).

Starting Salary Model

Following Barkley et al. the starting salary (earnings in the first job after graduation from SIUC) of individual i ($START_i$) of the Department of Agribusiness Economics was specified to be a function of three categories of explanatory variables, including college experience variables ($COLLEGE_i$), career choice ($CAREER_i$) variables, and demographic characteristics ($DEMO_i$).

$$(1)\ START_i = f\,(COLLEGE_i;\ CAREER_i;\ DEMO_i)$$

College experience variables. College experience variables include (1) highest degree earned in Agribusiness Economics (bachelor's or master's), (2) an advanced degree variable defined as additional degree(s) received such as Ph.D., M.B.A., J.D., or a M.S. earned in a different department at SIUC or at another university, (3) undergraduate GPA, defined as GPA = 1 if GPA > 3.0 and GPA = 0 if GPA < 3.0, (4) involvement in college internships, and (5) whether the student was a native or transfer student. Native alumni are graduates who spend their entire academic careers at SIUC, while transfer alumni are students who spend two years at a community college and then transfer to SIUC with junior standing and receive their bachelor's degree, usually four semesters (two years) later.

Career choice variables. Again following Barkley et al., the starting salary model also includes (6) length of time to obtain a job after graduation, (7) employer type (private and self-employed, or public and non-profit), and (8) job location (southern Illinois or elsewhere). Southern Illinois is defined as the approximately 60 counties that lie south of Interstate 70. Alumni working outside of southern Illinois are expected to garner a larger beginning salary than alumni that take a position in southern Illinois.

Southern Illinois is mostly rural and comprised of small towns, therefore, it is anticipated that salaries would be lower, reflecting lower costs of living. State and federal and nonprofit jobs are expected to have lower salaries than private industry employment, since government employment often provides more job security and better benefits than jobs in the private sector.

Demographic variables. Two demographic variables are included in the starting salary model, (9) family background and (10) gender. It is hypothesized that graduates with non-rural backgrounds are expected to receive higher starting salaries because alumni usually tend to return to the area where they grew up (Broder and Deprey) and as mentioned before, higher paying jobs are usually found in non-rural areas. The final variable in the starting salary model is gender. Previous studies estimated large and significant differences in earnings between males and females (Broder and Deprey; Preston et al.; Barkley; Barkley et al). It is anticipated that a large and significant difference in earnings also exists between male and female graduates of non-land-grant universities.

Current Salary Model

The model for the current (2001) salary of individual *i* ($CURR_i$) is comprised of the same group of variables found in the starting salary model ($COLLEGE_i$; $CAREER_i$; $DEMO_i$) and includes two additional variables: (1) adjusted starting salary ($AJSTART_i$), and (2) career experience ($CAR\ EXP_i$) to account for years of work experience.

(2) $CURR_i = f\ (COLLEGE_i; CAREER_i; DEMO_i; AJSTART_i; CAR\ EXP_i)$

The current salary model includes the same set of variables as the starting salary model with the following exceptions: (1) length of time to find employment after graduation and number of internships are not included because these two variables are directly related to the first job after graduation and (2) GPA, while retained in the current salary model, is treated as a time series using actual GPAs. Like the starting salary model, salary information on current salaries was actual salaries, not approximations of actual salaries.

Following Broder and DePrey, adjusted starting salary is included in the current salary regression model. Starting annual salaries were adjusted for inflation using the consumer price index (CPI). Starting salaries were adjusted to reflect 2001 dollars using 1980-82 base year prices. In addition, work experience, defined as number of years of work experience since college graduation, is included because it has been shown to have a positive relationship to current annual salary (Broder and DePrey).

Starting Salary Regression Results

The alumni starting salary model was estimated using multiple regression (ordinary least squares). Results are shown in table 1. The model was based on 137 usable observations. T-scores were used to determine levels of statistical significance of explanatory variables. *R*-square for the model was 36.5 and adjusted *R*-square was 31.5. As hypothesized, all variables had a positive effect on starting salary.

Annual average salary of responding alumni was $30,076 (2001 dollars). It was found that gender had a statistically significant effect on starting salary. Male graduates who responded to the survey experienced a beginning salary premium of $7,603 compared to female graduates. Goldin reported that the salary gap could be due to labor market discrimination, or due to females self-selecting into jobs of lower salaries due to more desirable working conditions, or more flexible work schedules and hours. Another possibility is that more females than males take positions in locations where the primary family wage earner's job is located (Barkley et al.) This possibility is probable for graduates of the Agribusiness Economics Department who return to the family farm or a family agribusiness like retail supply or machinery and equipment.

As anticipated, highest degree earned had a statistically significant impact on earnings. Respondents who earned a master's degree received a starting salary premium of $8,218 compared to a B.S. degree. The formal education variable was also statistically significant. Alumni who received additional formal education in addition to either the bachelor's and/or master's degree in Agribusiness Economics experienced a starting salary premium of $7,142 relative to a B.S. degree.

GPA was also statistically significant. A GPA of 3.0 or greater translated into a $3,117 salary premium relative to the default category of GPA less than 3.0. This result is consistent with advice typically given to students. Recent findings by Siebert et al. suggest that allocating more time to improving a student's GPA is appropriate advice for freshman and sophomores but not necessarily for juniors and seniors who desire higher than average starting salaries. The authors recommend that juniors and seniors would be better off allocating more time to work experience and leadership activities than trying to increase their GPAs.

Being a four year student (native) versus a transfer student also had a statistically significant impact on starting salary. Native students experienced a salary premium of $2,496 compared to transfer students. While the research reported here does not offer explanations for this result, the salary gap may reflect that native students generally have better academic backgrounds compared to transfer students (Johnson et al), backgrounds that translate into more marketable skills. This result is important and useful to student advisors and individuals responsible for curriculum design at community colleges and universities like SIUC that accept large numbers of transfer students.

Marginally statistically significant (10% level) was the variable for length of job search. Graduates who had secured their first post collegiate job prior to graduation earned a salary premium of $2,210 compared to alumni who found their first job after they graduated. This variable may serve as a proxy for certain "soft skills" like motivation, discipline, work ethic, and being goal oriented. Students who exhibit these "soft skills" probably experience a market return for possessing this skill set.

Other independent variables positively associated with starting salary, but not statistically significant, included number of internships, background (rural or urban), employer type (private or public), and job location (southern Illinois region or elsewhere).

Current Salary Regression Results

The current salary model was estimated using the responses of 130 respondents. Regression results are reported in table 2. The explanatory power of the current salary model was similar to the starting salary model. *R*-square was 37.8 and adjusted *R*-square was 32.6. Annual average current salary of responding alumni was $54,235 (2001 dollars). Similar to the starting salary model, all explanatory variables had the expected positive sign. Unlike the starting salary model, only three variables were statistically significant, adjusted starting salary (5% level), college GPA (5%), and years of work experience (1%).

The estimated coefficient on adjusted starting salary had a positive influence on future earnings, indicating a current salary premium of $759 for each additional $1000 in adjusted starting salary. Like the starting salary model, grades had a large influence on current salaries. In the current salary model, a 1 point increase in GPA (e.g., from 2.5 to 3.5), translated into an additional $10,827 in annual salary. This result reflects the idea that those who earn higher GPAs in college experience higher salaries later in their careers. As expected, work experience also significantly influenced a graduate's current salary. An additional year of work experience increased current salary $2,067.

Although the other explanatory variables had the expected positive correlation with current salary, none of these variables were statistically significant, including gender and highest degree earned. The lack of statistical significance is especially surprising with regard to gender and return to advanced degrees (explanatory variables that were significant in the starting salary model). In the starting salary model, male respondents experienced a beginning salary premium of $7,603 compared to female respondents. There was no statistically significant salary differential between males and females with regard to current salaries. While recipients of advanced degrees were rewarded with substantial salary bonuses in the starting salary model, salary premiums associated with advanced degrees were not statistically different than a B.S. degree in the current salary model.

Study Conclusions and Implications

The focus of this study was estimating a starting and current salary model for Agribusiness Economics graduates at Southern Illinois University, a non-land-grant university located in Carbondale, Illinois. Results of this study confirm many of the previous empirical results conducted at land-grant universities like the University of Georgia, Kansas State, and VPI. With regard to determinants of starting salaries, the labor market offers salary premiums to male graduates with GPAs greater than 3.0, who posses at least one advanced degree beyond a bachelor's degree, and enrolled at the university as a freshman, that is, spent all four years at SIUC versus completing the first two years of study at a community college and transferring to SIUC as a junior. The results of the current salary were more indeterminate. GPA, starting salary, and years of work experience were influential determinates of current salary. No significant salary differential existed, however, between males and females and advanced degrees were not highly rewarded in the market place like they were in the starting salary model.

On the basis of this research and the myriad of complex relationships examined in other studies pertaining to agricultural education and compensation at land-grant universities, the following can be said: (1) the directional relationship between salary and independent variables is extremely high, (2) many of the same independent variables are significant across the numerous studies, and (3) although coefficient estimates vary from one study to another, most are of the same order of magnitude. Consequently, the similarities mentioned above suggest labor markets are similar for graduates from land grant and non-land-grant universities. These findings provide students, faculty, and administrators with valuable information. Current and reliable salary information is highly valued by currently enrolled students and faculty advisors as a means of career decision making and the allocation of scarce labor resources to the highest return.

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