THE RELATIONSHIP OF UNDERGRADUATE INTERNSHIPS AND OTHER VARIABLES ON THE STARTING BASE SALARY OF AGRICULTURE GRADUATES AT MURRAY STATE UNIVERSITY 1992-1997

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CHAPTER I

INTRODUCTION

> Demographic backgrounds of students majoring in Colleges of Agriculture are changing. With more enrollment coming from urban areas, students have little or no personal experience with farming or other agricultural industries. Faculty and employers register a growing concern about a graduate's preparation to assume positions in agriculturally related firms. As the job market becomes more competitive, graduates are finding that good grades are not enough to help them land their first post-graduate job. As a result, experiential education is becoming important as an aspect of undergraduate education to meet a changing employment situation (Garkovich, Buch, & Davis, 1992, p. 25).

Since the beginning of this century academic internships and cooperative education programs have been used in a diverse manner in higher education institutions. However, their underlying value in aiding students in certain disciplines has never been widely established. These various cooperative and internship programs, typically offered for either course credit or non-credit, have been a fundamental way for undergraduate students to gain valuable career experience in their selected areas of interest and to aid in their marketability in today's notoriously competitive job market.

Internships, some following a structured pattern and some being rather loosely guarded, have sprang to the forefront of debate in many institutions of higher education as possible requirements for undergraduates seeking degrees in selected academic areas or majors. While this issue of mandation continues, most research seems to indicate that

internships do in fact enhance students' opportunities giving them a substantial edge academically, personally, and professionally in the world of work.

Statement of the Problem

While many of today's undergraduate agriculture students choose to take advantage of industry-related internships and cooperative work experiences, many do not. Likewise, due to the lack of specific information concerning the fundamental value of undergraduate agricultural internships, those working with related programs in university settings have little information with which to quantify important program management decisions. In addition, agriculture students and faculty alike have the need to be well informed of critical information in making decision's which may have the potential to affect student academic success, and ultimately their income earning potential within the early part of their careers.

For this reason a detailed comparison of students completing undergraduate agricultural internships versus traditional students not involved in an experiential learning activity is needed in determining which route best serves graduates and their starting salaries. In addition, a variety of variables should be identified and utilized to canonicaly predict internship completing students' starting base salary success.

Rationale of the Study

Finn (1997), in her article Toward a New Paradigm for Cooperative Education, utilized the following quote in the rationalization of the need for further research in cooperative education:

> The 21st century. The second century for cooperative education. The approach of such arbitrary divisions of time creates opportunities for reflection and self examination, much as each new year invites resolutions for change. For a moment, we are poised in the space between the old and familiar and the new and unknown, freed from old shackles and open to possibilities. One possibility for cooperative education is the emergence of a new paradigm to usher us into our second century-a paradigm of research, knowledge development, and theorizing, using multiple ways of knowing, to re-conceptualize cooperative education as an emerging academic discipline (p. 36).

Finns' (1997) account of this new paradigm of research in cooperative education is inherently needed in the area of agriculture, and particularly in the state of Kentucky. This is defensible in the assertion by the Economic Research Service of the United States Department of Agriculture which states that the combined agricultural sector output for Kentucky in 1995 totaled $3,594,100,000 with over twenty percent of the workforce in 1994 being employed directly in farm and farm related jobs, thus making the agricultural industry one of the most predominate employers within the state (Economic Research Service, 1998).

In addition, Van Gyn, Cutt, Loken, and Rick (1997), in their article concerning the benefits of cooperative education, suggest that an increase in empirically based research, instead of theoretically based research, be conducted to further establish the applicability of cooperative education. Likewise, Stull, Crow, and Braunstein (1997) identified from their review of previous studies in the Journal of Cooperative Education that further

research should be conducted on the related effects of grade point average and to determine the most advantageous number of internships needed by students to facilitate optimal starting salary and career growth.

Considering the opportunities for university faculty and employers alike to re-conceptualize cooperative education in undergraduate agriculture programs, it is important to determine the criteria needed in validating and structuring programs to assist agriculture students in meeting the challenges of the 21st century.

Purpose of the Study

The purpose of the study was to determine and compare if there was a relationship between starting base salaries, number of internships, and selected other variables among agricultural graduates from Murray State University for the period 1992-1997.

Objectives of the Study

In order to achieve the purpose of the study, the following objectives were established:

1) To determine selected demographics of Murray State University Agriculture graduates between 1992 and 1997.
2) To compare starting base salaries of graduates from Murray State University with a Bachelor of Science degree in an agricultural discipline who had completed one or more internships with graduates who followed the traditional non-internship route.

3) To determine if the number of internships completed had a relationship to the graduates' starting base salary.

4) To determine if the number of months spent in the internship had a relationship to the graduates' starting base salary.

5) To determine if the academic major upon graduation had a relationship to the graduates' starting base salary.

6) To determine if grade point average upon graduation had a relationship to the graduates' starting base salary.

7) To determine if gender had a relationship to the graduates' starting base salary.

8) To determine if prior work experience had a relationship to the graduates' starting base salary.

Assumptions of the Study

The researcher made the following assumptions with regard to the research study:

1) That all respondents of the survey fully understood each of the nineteen questions.

2) That all respondents participating in the study were honest in their responses to the survey questions.

Limitations of the Study

The researcher was limited in this study to the availability of the graduates' most current address(es). In addition, the researcher acknowledges the frequent relocation of

college graduates early in their careers and the possibility of a marginal degree of non-respondent's due to the logistics of effectively and accurately locating the population. As a benchmark, authors of similar studies noted the following response rates: Garkovich, et al. (1992) 51 percent; Horowitz (1996) 48 percent; Dubick McNerney, and Potts, (1996) 37 percent; Rogers and Weston (1987) 48 percent; and Gardner, Nixon, and Motschenbacher, (1992) 46 percent.

In addition, data collected concerning salaries over the six-year time period were not adjusted for inflation or took into account the interstate or intrastate differences in the cost of living. Furthermore, the researcher had no way of measuring the variables of socio-economic status or the individual work ethic of the subjects. Conclusively, it was identified that many of the respective academic specialization's within the study were analyzed using small samples of thirty or less.

Delimitations of the Study

Delimitations of the study consisted of the years in which the researcher elected to survey graduates (1992-1997). An additional delimitation of the study was the instrument of choice and the establishment of that specific data gathering instrument.

Scope of the Study

The scope of the study consisted of all graduates of Murray State University (Kentucky) Department of Agriculture obtaining a Bachelor of Science degree between the years of 1992-1997.

Definitions and Notations of Abbreviations

The following definitions apply to selected terminology applicable to this study:

Cooperative Education

The Cooperative Education Association defines cooperative education as the integration of classroom theory with practical work experience under which students receive specific periods of attendance...and specific periods of employment (Collins & Cohen, 1977, p. 13, as cited in Vickers, 1990).

Co-op

An abbreviation denoting Cooperative Education

Internship

The National Society for Internships and Experiential Education (NSIEE) defines an internship as any carefully monitored or service experience in which an individual has intentional learning goals and reflects actively on what he or she is learning through the experience (Gilbert, 1995, as cited in Horowitz, 1996).

Murray State University

A regional state-supported university located in the Jackson Purchase Area (southwest corner) of the state of Kentucky. Murray State, located in the City of Murray, was founded in 1922 and at the time of research had an enrollment of 9,000 throughout six academic colleges. Murray State had consistently ranked among the top twenty five percent of Southern regional colleges and has been accredited by the Southern

Association of Colleges & Schools (SACS) on a continual basis since 1928 (Undergraduate Bulletin, 1997-1999). The Department of Agriculture is housed in the College of Industry and Technology with an average enrollment of 550 students. The University currently has a cooperative education department as well as internships ran by many of the academic departments.

Starting Base Salary

For the purpose of this study starting base salary refers to the salary that a graduate of an undergraduate program receives in the first full-time position upon graduation. This excludes bonus packages, commission, over-time pay, or exercises of stock options or other benefit packages.

Traditional College Graduates

For the purpose of this study the researcher identified traditional college graduates as graduates with Bachelor of Science degree's who did not complete an internship or cooperative education unit during their undergraduate career.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The purpose of this chapter was to provide an overview of the available literature addressing cooperative education and internships in the United States. The researcher utilized a compilation of professional journals and books on cooperative education, agriculture, and extension education. In addition, reviews were conducted using governmental documents, magazines, and research information made available from various university departments and directors of cooperative education.

The author conducted this review of literature by organizing it into five categories and a summary. The following were the identified categories: 1) An Overview of Cooperative Education, 2) Cooperative Education: A Historical Perspective, 3) Cooperative Education: Models and Frameworks, 4) Cooperative Education: Non-Economic Benefits, 5) Cooperative Education: It's Measurable Effects on Starting Salary, and 6) A Summary of Literature.

Overview of Cooperative Education

Since the beginning of this century internship and cooperative education directors have struggled with how to identify and define their programs content. While many continue to argue over the programmatic application, several well known authorities have developed universally accepted definitions of both internships and cooperative education.

Gilbert (1995) cited by Horowitz (1996) indicated that one of the most forthright authorities, the National Society for Internships and Experiential Education (NSIEE), defines an internship as any carefully monitored or service experience in which an individual has intentional learning goals and reflects actively on what he or she is learning through the experience.

Likewise, the Cooperative Education Association (CEA) states that cooperative education is:

> ...the integration of classroom theory with practical work experience under which students have specific periods of attendance...and specific periods of employment (Collins & Cohen, 1977, p. 13, as cited by Vickers, 1990).

As can be deducted, numerous and very parallel definitions for cooperative education and internships are present. Ryder, Wilson, and Associates, (1987) reiterates the concept of cooperative education by stating that:

> ...cooperative education is a particular application of the concept of experiential learning in which productive work by students is integrated into the curriculum and for which the institution assumes primary responsibility (p. 2).

For the purposes of this study the researcher recognized internships and cooperative education as the same experience.

Cooperative Education: A Historical Perspective

The Early History

The history of cooperative education, and specifically internships, stems back to 1906 where they were used on an experimental basis and interwoven into the regular curriculum at the University of Cincinnati. According to Knowles (1972) the first internship program to be developed was the inspiration of Herman Schneider, an engineering professor who was later dean of engineering and for a brief time president of the University of Cincinnati. The idea was spawned and brought with him from Lehigh University in 1903, and in 1906 he was given the authority to institute it at the University of Cincinnati as the first officially recorded cooperative education program in the United States.

As a direct result of his new program Dean Schneider sought to provide alternatives to two major problems at the university. Schneider first envisioned a way to provide adequate work experience as an educational supplement to the rigorous formal academic programs and allow students the opportunity to apply academic theory to application based problems. And secondly, he found that most students wanted to work during their college careers and most on-campus work experiences afforded little or no career relatedness. Therefore, he pushed to implement his bold plan to enhance a synergistic relationship between formal academic and economic needs, as well as providing professional experiences for engineering students.

Subsequent to the pioneering work of Dean Schneider in 1906, other well-established universities began implementing programs modeled after his success. In

the years shortly after the establishment of the University of Cincinnati model, the prestigious Northeastern University, Rochester Institute of Technology, Marquette University, and the Massachusetts Institute of Technology all developed programs similar to Schneiders'. However, it was not until 1921 that cooperative education and internships made their way into liberal arts institutions. In 1921, apart from the preceding vocationally oriented internships, Antioch College inaugurated the first liberal arts internship program in the nation. Momentarily, internship programs were on the rise in America.

Philosophical Foundations of Cooperative Education

With the continued industrialization of America, institutions of higher education were forced to find new ways to apply newly invented technologies. Ryder et al. (1987) reported that in meeting these challenges, and to keep up with advancements, many educators including Schneider thought that education, and particularly cooperative education, should assume the role of pragmatism as its primary form of educational philosophy. Thus Ryder et al. notion of pragmatism held with it the underlying belief that if an institution was going to educate a student to do something, then it should provide that student with the opportunity to practice it. Furthermore, Ryder et al. in mirroring Dewey's pragmatic theory of education states that:

> The essence of cooperative education is that it is a strategy to provide students with experiences that are applicable to their future working lives and to their roles as informed, responsible citizens (p. 8).

Growth and Development

Just as cooperative education survived the World Wars, it began to flourish in the post-war society. As millions of young men returned home in search of educational opportunities, cooperative education began to expand and thus recognized the need for professional affiliation and a nationwide organization. Consequently, Knowles (1972) pointed out that the organization of the first association, which was specifically oriented toward engineering education, was organized by Schneider in 1926 and termed the Association of Co-operative Colleges.

Heineman, Wilson, Heller, and Craft, (1982) stated that in the 1950's corporations, states, and foundations began to recognize the need for continued organization thus providing funding for conferences and conventions. As a direct result of these multi-sponsored conferences the early 1960's saw the establishment of the National Commission for Cooperative Education (NCCE) chaired by the highly acclaimed educator, Ralph Tyler. According to Knowles (1972), as a result of this national commission, a provision of Title III of the Higher Education Act of 1965 made available funds to qualifying institutions who wanted to establish structured cooperative education and internship programs. Further development as disclosed by Ryder et al. (1987) showed that:

> In 1963, the Cooperative Education Association (CEA) was formed as a professional society for the many academic fields beyond engineering that had embraced co-op (p. 19).

With the establishment of numerous national commissions and the magnified interest by corporations and institutions, cooperative education began to solidify its roots.

As cooperative education began to grow in the 1970's, so did its hurdles. For instance, in one particular area of the country, Heineman et al. (1982) stated:

> ...that while there had been a very dramatic increase in the number of programs, the number of students involved in any one program remained relatively small, except for a handful of institutions, such as Northeastern University and LaGuardia Community College/City University of New York where cooperative education is mandatory (p. 8).

Congressional Legislation and Studies

It was also noted that during 1975 Congress appropriated funding to conduct a nationwide survey among higher educational institutions. The following culmination of findings were reported by the study:

1) Cooperative education is endorsed by participating institutions, employers and students.
2) Participation in cooperative education contributes significantly to the career preparation of students.
3) Cooperative education is a mechanism for student financial aid.
4) Cooperative education is cost-effective for students.
5) Cooperative education is cost-effective for employers.
6) Cooperative education constitutes a program cost for institutions of higher education.

Other conclusions drawn from the study were that:

7) Title IV-D of the Higher Education Act has made a significant contribution to the national expansion of cooperative education.

8) It was a sound legislative decision to support cooperative education through direct grants to institutions rather than through direct grants to scholarship or loan funds to students or by subsidizing cooperative education employers.

9) The federal investment in Title IV-D, and now Title VII, is currently more cost effective than the federal loan program.

10) Federally funded and non-federally funded cooperative education programs exhibit similar characteristics, and students and employers assessed them similarly.

11) The future prospects for the continued expansion of cooperative education are good (Frankel, Cohen, & Dean, 1978, as cited in Heineman et al., 1982, p. 10).

Cooperative education and internship programs underwent a dramatic upswing in the 1980's as more students became attuned to the experiential and economic advantages of the programs. Likewise, they continue to expand today as an increasing amount of students recognize the benefits that they afford.

Today many colleges and universities, both liberally and vocationally oriented, administer cooperative education and internship programs in various ways for the mutual benefit of the student and the institution.

Cooperative Education: Models and Frameworks

There are a host of models, or structured frameworks, that institutions use in administering their cooperative education and internship programs. Likewise, many

institutions utilize a conglomeration of these. While these models are under constant evaluation as to the most effective form, most hold with them the following four traditional factors in their framework. Knowles (1972) conveyed the four in his statement that:

> The following factors be adhered to as closely as possible: 1.) The student's off-campus experience should be related as closely as possible to his field of study and individual interest within the field. 2.) The employment must be a regular, continuing, and essential element in the education process. 3.) Some minimum amount of employment and minimum standard of performance must be included in the requirement. And, 4.) The working experience will ideally increase in difficulty and responsibility as the student progresses through the academic curriculum and, in general, shall parallel as closely as possible his progress through the academic phase (p. 30).

Cooperative Education Types

Knowles (1972) proposed that cooperative education and internships may also be classified into three types. The first type, mandatory, holds cooperative education as a keystone of their educational philosophy. These institutions are said to have mandatory program's which must be planned for when the student enrolls. Moreover, Knowles states that:

> Students enrolled in mandatory programs are expected to complete satisfactory periods of work and off-campus experience as part of the total requirements for the degree. These institutions have a strong belief in the values of off-campus experience for their students (p. 31).

The second type of cooperative education included optional programs. Optional programs allow students to select whether or not they wish to participate in a co-op plan of study or remain with the traditional method of non-cooperative graduation. Knowles (1972) points out that:

> Students who wish to pursue the cooperative education plan of study are accepted or rejected on the basis of their qualifications and their interest in the program. Some colleges and universities require students to have their own job or off-campus experience determined and available before entering the program. Optional programs may involve only a small number of students in very large institutions and may be limited to particular departments of colleges or individual colleges within a university (p. 31).

The third type identified by Knowles (1972) under this classification are the selective programs. Selective programs enroll students solely on the basis of academic performance. Students in these types of programs are usually required to maintain a specified grade point average to continue/remain on the cooperative plan of study.

Organizational Variations or Models

Another model of classifying program's of cooperative education are known as organizational variations (Ryder et al., 1987). These descriptions of models deal with the organizational and logistical set-up of the programs.

The first type, known as the alternating type or the classical Cincinnati type, was modeled after Dean Schneider's early 1906 experiment with students at the University of Cincinnati. His plan asserted the concept that student's would be split into two groups with one group working off-campus one semester and the other group the next semester with groups taking courses in the interim. This plan generally substantiated an additional year or more for graduation (Ryder et al., 1987).

As cooperative education and internships began to migrate to curriculums outside engineering, another form known as the parallel plan began to take shape. The parallel plan could be thought of as a half-day alternation with students attending classes during

the mornings and going to employment related to their curricular studies in the afternoon or evenings. This type of plan was useful when working with non-traditional students whom otherwise would be unable to participate in cooperative education, as well certain areas of academic specialization (Ryder et al., 1987).

While no single program type or model will conform to every institution, there are several noteworthy advantages of each. Ryder, et al. (1987) reiterates the flexibility of the classical model as being alternating, highly centralized, requiring little direct involvement of the teaching faculty, and performing optimally in specialized academic disciplines such as engineering and technology. While on the other hand, pointing out that the parallel model may be more optimal for continual instructor involvement, non-traditional students, and in smaller more liberally oriented programs.

Ryder, et al. (1987) continues to point out that even though each model is different, what is important is selecting the model that most optimally suits the institution and the students participating.

Cooperative Education: Non-Economic Benefits

There are a host of perceived advantages and disadvantages that students may gain from participating in internships. It is predicted by Wendling (1996) as cited by Horowitz (1996) that thirty percent of students graduating college between 1992 and the year 2000 will be unable to find college level jobs when they graduate. Given the assumption that this is true, students and university administrators should thoroughly investigate the possible benefits that students derive from internships and cooperative education.

While many argue that students engaged in internships gain a better perception of relationships between theory and application and are more acclimated to the world of work, there are other perceived benefits which can be identified. The listings below were identified by Kerka (1989):

1) Clarification of career goals.

2) Increased relevance of learning and motivation for study.

3) Improved self-reliance, self-confidence, and responsibility.

4) Practice in human relations skills.

5) Financial assistance for educational expenses.

6) Contacts with potential employers.

7) Feedback through performance assessment.

8) Employability skills and marketable job skills.

9) Exposure to practicing role models.

10) Higher starting salary after graduation (p. 1).

In addition, the following are discussions of benefits cited in professional literature that were directly, or indirectly, addressed in the research design of this study.

Higher Academic Achievement

A correlation between higher academic achievement and cooperative education, as well as the effects of grade point average of interns and its relationship to starting salaries, has yet to be scientifically substantiated and accepted in all areas of academia.

However, several studies do show relationships between grade point average of interns and higher starting salaries, as well as the effects of internships in obtaining higher

grade point averages. Two studies, conducted by McNutt (1974) and Spect (1985) as cited by Vickers (1990), compared academic achievement of internship students with non-internship students. Both studies provide substantial evidence that comprehension, retention rate, and grade point averages where significantly higher for interning individuals.

One major study reporting the influences of co-ops on engineering students versus non-co-op engineering students at Michigan State University cited the following:

> The cumulative grade point average for the sample was 3.12. Co-op students had significantly higher GPA's with an average of 3.19, compared to 3.10 for non co-op graduates. While women earned higher grades (average 3.16) than men (3.10), the difference was not significantly different. Grade point average did vary by academic major with mechanical, electrical, chemical and computer science students earning a cumulative average of 3.14 compared to 3.08 for engineering arts, civil and agricultural engineering (Gardner et al., 1992, p. 18).

Correspondingly, in the same study Gardner et al. (1992) found that "Grade point average was positively related to salary; for every .01 increase in GPA, starting salary increased by approximately $5.00 (p. 21)."

An additional study performed by Stanton (1988) as cited in Vickers (1990) indicated a small, but statistically significant, difference in grade point averages between interns and non-interns, with interns receiving slightly higher grades. Furthermore, Stanton (1988) as cited by Vickers (1990) points to a series of studies conducted in the 1970's that yielded an alternate hypothesis that students completing experiential education did in fact score higher on the Graduate Record Examination.

Likewise, and with respect to starting salaries, Wessels and Pumphrey (1996) hypothesized that grade point average does have a positive effect on wages and that

graduates with higher grade point averages tended to earn higher starting salaries. From these indications there seems to be a twofold advantageous effect. One, the student achieves higher grades as a result of the internship experience, and two, higher grades play a significant role in obtaining jobs with higher starting salaries.

Faster Job Attainment

Faster job attainment upon graduation for interns could in many cases be an attractive benefit to cooperative education. Time Magazine (1998) recently reported that fifty-eight percent of college graduates expected to find a job within three months of graduation. Whereas different situations, academic specialization, and geographical area yield different results, many indications show that this is an obtainable goal, although some researcher's would disagree.

For instance, and as a dispelling statement, Wessels and Pumphrey (1995) reported that the mean job search time among graduates of North Carolina community colleges for first time jobs was 6.47 months for all graduates. Comparatively, the average was 5.57 months for males and 7.37 months for females.

In an additional study concerning job search time, Rogers & Weston (1987) discovered that among engineering graduates at North Carolina State University:

> ...slightly less than half of each group reported obtaining their jobs immediately after graduation. Seven percent of the co-op graduates as compared to twelve percent of the non-co-op graduates took longer than three months to find their jobs. These differences, however, are not statistically significant (p. 36).

On the other hand, Dubick et al. (1996) encountered in their research that there

was a significant difference in the time to obtain a job after graduation for computer science interns as opposed to non-interns. They confirmed that:

> ...the average number of months co-op graduates spent seeking employment was 1.16 months, while the average amount of time for non co-op students was 2.87 months. Frequency distributions showed that it took four months for co-ops to reach 90% employment, while it took non co-op participants nine months to reach 90% employment (p. 71).

A supplementary study by Hamlin (1978) as cited by Vickers (1990) indicated that sixty-three percent of co-op graduates secured a full time job in less than one month after graduation, while only thirty-seven percent of non co-op graduates did.

In an academic area specifically related to the field of agriculture, researchers from the University of Kentucky reported in a recent study of cooperative education graduates that:

> Nearly half (respondents) reported that they had a firm job offer prior to graduation and for the rest, they averaged four months following graduation to search for and begin a job. The great majority stated that their field work experience had given them an edge in searching for a job and that potential employers viewed them more positively because they had this experience (Garkovich et al., 1992, p. 29).

As can be seen, controversial findings have been reported thus making it difficult to adequately establish if a true relationship exists between internships and faster job attainment. Conclusively, it might be said after reviewing the literature that localized research in individual academic areas and geographic locations is needed in discovering if cooperative education actually acts as a catalyst in decreasing the time spent securing a position upon graduation.

Personal Development

Interns and cooperative education participants cite numerous reasons for participation in programs other than monetary rewards. Studies and student responses indicate that individuals gain a multitude of personal development benefits when involved in cooperative education. Researchers such as Fletcher (1991) point to cooperative education increasing self-confidence, self-concept, autonomy, social maturity, and interpersonal skills. Additionally, Williams (1991) reported student advancement in self-respect, confidence in social interaction, increased human relation skills, maturity, concentration ability, and less anxiety and depression as positive benefits.

Career Development

Another identified benefit reported by Fletcher (1991) was career development. This notation brings about the assumption that a relationship exists between co-ops and long-term career development. One noteworthy conjecture was addressed by Foster et al. (1986) in their summary of Atkins (1980) study:

> ...on the relation of co-op programs in nursing to longevity of first employment, job satisfaction, and cost effectiveness. The data indicated that registered nurses who had co-op experience had greater longevity in first employment than either those included in the national average or current graduates without co-op experience. In addition, those nurses who had been co-op students reported greater job satisfaction than those without co-op experience (p. 48).

Hamlin (1978) as cited by Vickers (1990) also discovered the following:

> That 54.1% of co-op graduates received pay increases in the $2,501-$5,000 range while only 45.9% of non co-op graduates earned the same amount, and the co-op graduates received promotions faster. Hamlin also

> found that 61% of co-op graduates held jobs in their major as compared to 39% of non co-op graduates (p. 17).

Additional Benefits

Additional benefits may also be concluded with participation in internships. Further literature by Walsh (1976) as cited by Vickers (1990) reveals that the Department of Health, Education and Welfare identified a number of additional benefits. They concluded that:

1) For all programs considered, men generally earned more per week than women.
2) In post-secondary specific occupation programs, whites and blacks earned more per week than their comparison group members.
3) On the secondary level, men were more consistently employed than women.
4) On the post-secondary level, there were no measurable differences in job stability between men and women.
5) Blacks participating in post-secondary specific occupation programs worked more weeks per year than blacks in non-participating comparison groups (p. 29).

Cooperative Education: It's Measurable Effects on Starting Salary

The true value of internships and cooperative education has yet to be canonically determined. However, research seems to provide conclusive evidence that some economically oriented benefits are derived from participation. For instance, Gardner et al. (1992) states that:

> The cooperative education experience provides opportunities for a student to gain work related skills that are viewed as an investment toward achieving a quality job upon graduation. It has long been assumed that co-op participants gained an advantage in terms of employment outcomes (p. 25).

The generalization of economic benefits and employment outcomes is primarily directed to the effects of cooperative education on starting salaries of graduates. While many of the previous non-monetary benefits seemed to have both pro and con advocates, current research within the last decade seems to conclude that there is a substantial increase in starting salaries of graduates who participate in internships and cooperative education.

As an example, Rogers and Weston (1987) concluded in their study of engineering graduates at North Carolina State University that:

> ...those who had participated in cooperative work experience reported salaries that are higher than the non co-op group. The chi-square statistic indicates a significant relationship between co-op participation and starting salary. Almost three-fourths (73%) of the co-op graduates reported salaries of $24,000 and over, as compared to 43% of the non co-op group (p. 36).

Further evidence of a significant study concerning starting salary differences was reported by Gardner et al. (1992) as indicated by the following data assimilated on Michigan State University engineering graduates. Gardener et al. stated that:

> For nine years during this period (1979-1989), cooperative education graduates received higher starting salaries. In 1989 non-cooperative salaries were on average slightly higher than co-op salaries. Non co-op students have experienced several years of strong starting salary increases during the late 1980's to close the gap. Overall, co-op subjects had an average starting salary of $18,201 as compared to $17,593 which was statistically significant at the $p<.001$ level (p. 18).

Likewise Wessels and Pumphrey (1996), in their article addressing the Impact of Cooperative Education on Wages, reported an increase in first job salaries of 5.62 percent for males and seven percent for females among those who had interned versus those who had not. In a similar style, Brock et al. (1984) as cited in Siedenberg (1989) concluded

that 91.3percent of marketing students who had completed internships reported higher starting salaries than individuals who had not taken the opportunity to participate in an internship. Gardner et al. (1992) also stated in a conclusion of his study that:

> Co-op also had a positive impact on salary (starting), being significant at the .03 level. Having a co-op contributed slightly more than $300 to starting salary, all other things being equal (p. 21).

An additional study by Dubick (1996) concluded through the use of multiple linear regression that computer science graduates with co-ops had a positive mean difference in starting salary of $3,754.27 over traditional non co-op graduates.

Moreover, several research studies have been conducted in determining the optimal number of co-ops or internships that a student should complete to enhance their starting salaries. One corresponding study on engineering graduates done by Gardner and Motschenbacher (1993) stated that:

> Co-op participants with three or more terms of experiences were found to have higher starting salaries than all other groups. ...the co-op group with three experiences had significantly higher starting salaries than the groups with no work experience and summer employment. This group (those with three terms experience) also maintained more than a $1,000 advantage over interns and the two-or- less co-op group (p. 7).

Gardner et al. (1992) in a comparable study of engineering students reported that:

> A comparison of the means found the starting salary for co-op participants with one or two experiences (terms) was not significantly different from the non co-op graduates. Only when a co-op participant had been involved in three quarters or more of co-op were higher salaries realized. Starting salaries continued to increase up to five experiences. At this point a threshold or optimum point was reached after which the marginal change in salary was negative. Graduates with more than five experiences still made significantly higher salaries than those with three or fewer experiences (p. 22).

Conclusively, the National Commission for Cooperative Education (1975) had this to say about cooperative experience and salary:

> Co-op is the ultimate in personal and career development. Based on their experience, co-op graduates usually command higher starting salaries than their counter parts from traditional programs. And they move more rapidly up the career ladder, receiving merit raises and promotions more frequently than their non co-op associates (p. 4).

While the general opinion among researchers seems to be targeted towards co-ops increasing individual starting salaries, there has yet to be much research completed in many fields other than business and engineering. Regretfully, and after an extensive review of the literature, the researcher found no studies directly related to the effects of co-ops or internships or differences between the two concerning starting salaries of agriculture graduates.

Summary

This chapter focused on a representative portion of the literature/information available concerning the identified categories of 1) An Overview of Cooperative Education, 2) Cooperative Education: A Historical Perspective, 3) Cooperative Education: Models and Frameworks, 4) Cooperative Education: Non-Economic Benefits, and 5) Cooperative Education: Its Measurable Effects on Starting Salaries.

Cantor (1995) in his summary of the perceived benefits derived from participation in cooperative education concluded with the following statement:

> Students participate in cooperative education for many reasons. These include those financial benefits which help pay for their education, to the benefits to be derived in learning to perform in their chosen occupations or careers, and to experiences gained for job-placement purposes. Increasing

> numbers of faculty recognize the benefits of providing students with real-world experiences that complement formal classroom study (p. 3).

As can be seen from Cantor's (1995) quote and other countless sources of literature profiling the primarily positive attributes of cooperative education and internships, how can one negate or discourage their use in institutions of higher education?

Cantor (1995) eluded that current levels show more than 1,000 post-secondary institutions offer some form of internship experience to over 250,000 students with more than 50,000 employers participating. It is because of these figures, and the perceived benefits that participation provides, that institutions of higher education must begin turning their attention and resources toward the development of quality programs which will enhance and initiate long-tem benefits for students and organizations for years to come. In addition, educational institutions must begin to focus on quality localized research in order to provide cooperative education program directors, administrators, and students alike with reliable information about student participation and experiences in cooperative education among the various academic disciplines and geographical areas of the country.

CHAPTER III

METHODOLOGY

Purpose of the Study

The intent of this chapter was to describe the research methods employed in conducting the study. The purpose of the study was to determine and compare if there was a relationship between starting base salaries, number of internships, and selected other variables among agricultural graduates from Murray State University for the period 1992-1997.

Objectives of the Study

In order to achieve the purpose of the study, the following objectives were established:

1) To determine selected demographics of Murray State University Agriculture graduates between 1992-1997.
2) To compare starting base salaries of graduates from Murray State University with a Bachelor of Science degree in an agricultural discipline who had completed one or more internships with graduates who followed the traditional non-internship route.

3) To determine if the number of internships completed had a relationship to the graduates' starting base salary.

4) To determine if the number of months spent in the internship had a relationship to the graduates' starting base salary.

5) To determine if the academic major upon graduation had a relationship to the graduates' starting base salary.

6) To determine if grade point average upon graduation had a relationship to the graduates' starting base salary.

7) To determine if gender had a relationship to the graduates' starting base salary.

8) To determine if prior work experience had a relationship to the graduates' starting base salary.

Population of the Study

The population of this study was comprised of 417 graduates of the Murray State University Department of Agriculture that had obtained Bachelor of Science degrees in an agricultural discipline between the years of 1992-1997. The population was identified and located using departmental records in conjunction with the Murray State University Alumni Relations Office.

The researcher elected to survey the entire 417 individuals comprising the study population instead of utilizing a representative sample.

Development of the Instrument

In achieving the purposes and objectives of the study the use of a mail survey was deemed necessary to provide optimal value, efficiency of time, and accuracy of data collection. The researcher, after an extensive review of the literature, was unable to find similar instruments relating to the agriculture discipline, whereas one was constructed explicitly to meet the objectives of this study.

In developing the instrument, the researcher attempted to emphasize the respondent's ease for reading, minimal time for respondent completion, and specificity of responses. In addition, the instrument was designed to allow the researcher opportunity to assess the data in order to fulfill each of the objectives, ease of compilation and data entry, as well as to provide additional information other than that required for the objectives to be used as supporting data.

Furthermore, the researcher validated instrument content through the use of a jury of academic specialists from three different institutions of higher education. The three groups comprised two faculty members from the Murray State University Department of Agriculture, one faculty member from the Oklahoma State University Department of Agricultural Education, and a statistician from the University of Memphis. Attempts to establish instrument reliability were directed through the use of a pilot study which was subsequently addressed.

Instrument Content

The instrument contained nineteen total items presented in two sections. The first section was comprised of eleven questions specifically assessing information from graduates who had completed at least one internship or cooperative education unit. The first ten questions within this section allowed the respondent to select one answer from a group of two to ten applicable answers. Question eleven utilized a five-point Likert-type scale response in assessing the graduates' perception as to the importance of the internship experience in obtaining a higher starting base salary.

Section two of the instrument was comprised of eight questions examining both graduates completing internships or cooperative education units and traditional non-internship graduates. The eight questions within this section also allowed the respondents to choose an appropriate response.

In the assessment of the second section, two distinct questions were posed so that the responses were available in interval form. The first question, number fourteen, was an inquiry into the graduates' starting base salary and was constructed so that respondents could select from a range of salaries in one-thousand dollar increments. Furthermore, question number sixteen, assessing respondents' grade point average upon graduation, was presented so respondents could select intervals of .25 between 2.0 and 4.0. For the purposes of data entry and analysis, question number sixteen assessing grade point averages was entered using mid-point intervals.

Further arrangement of the survey format included questions that might be deemed personal by respondents and therefore strategically placed at the end of the

instrument. Conclusively, a copy of the cover letter, instrument, and follow-up letter may be found in the appendix of the study.

Institutional Review Board (IRB)

Federal regulations and Oklahoma State University policy require review and approval of all research studies that involve human subjects before investigators can begin their research. The Oklahoma State University Office of University Research Services (IRB) conducts this review to protect the rights and welfare of human subjects involved in biomedical and behavioral research. In compliance with the aforementioned policy, this study received the proper surveillance and was granted permission to proceed. This research was assigned the following research project number: AG-98-041. A copy of the approved IRB approval form is presented in Appendix D.

Pilot Group Test

The pilot group was comprised of twenty-six graduates resulting in a response rate of twenty-one fully completed surveys. The pilot group was used to test for the instruments' clarity, formatting of questions, choice of answers, design, and appropriate statistical formulations. The pilot group returns indicated that verbal clarity was needed in one of the questions and within one of the available answers. Both revisions were made immediately.

Upon completion of the pilot group assessment, analysis were made to determine the reliability coefficient of the instrument. It was determined through the testing method

of Cronbach's Alpha that parts of the instrument were not parallel and the alpha coefficient of .12 represented the lower bound limit of reliability.

Data Collection

Upon analysis of the pilot group data the first initial mailing was sent by United States Mail approximately four weeks later. Each of the 417 envelopes mailed contained a cover letter explaining the purpose of the survey, the three-page instrument, and a self-addressed postage paid return envelope. Each of the return envelopes were coded so that follow-up letters might be sent to non-respondents if deemed necessary.

Due to the likelihood of numerous forwarding addresses among recent graduates, resulting in a increase in time required for responses, the researcher elected to allow four weeks from the initial mailing until a follow-up letter was sent to non-respondents. An additional attempt by telephone was made to contact a portion of the non-respondents to determine if their responses differed from those returned and to control for non-response error. However, this proved to be relatively ineffective and was discontinued due to the frequency of relocation among early graduates, as well as the sensitivity of the question assessing salary.

Response Rate

Of the 417 graduates surveyed, approximately 195 returned completed surveys applicable for data entry. This resulted in a 46.76 percent total response rate for the study.

Data Analysis and Statistical Design

Upon return of all applicable respondent information, data were analyzed using both descriptive and multiple forms of parametric statistical techniques in fulfilling the stated purpose and objectives of the study. A pre-determined confidence interval of ninety-five percent (α=.05) was identified and used in all computations. Furthermore, all inferential computations were used as an indicator to the population and not for direct inferential purposes.

Objective number one, which assessed selected demographic characteristics of the respondents was achieved using descriptive statistics and frequency tables. Objective number two, which was used to compare groups of graduates starting base salaries, was accomplished through the use of One-way Analysis of Variance (ANOVA) and the post-hoc multiple comparison test of Least Significant Difference (L.S.D.). The primary use and presupposition of the One-way Analysis of Variance explained by Glass and Hopkins (1996) as a statistical technique was used to:

> ...determine whether the differences among the J (J>2) means are greater than would be expected from sampling error alone. ANOVA permits the control of alpha at a predetermined value when simultaneously testing the equality of any number (J) means. In ANOVA, all differences for all pairs of J means are examined simultaneously to see if one or more of the means deviates significantly from one or more of the other means. Thus, ANOVA has three definite advantages over separate t-tests when J>2: 1) It yields an accurate and known type-I error, 2) It is more powerful – that is, if the null hypothesis is false, it is more likely to be rejected, and 3) It can assess the effects of two or more independent variables simultaneously (p. 377-378).

In like manner, the use of the post-hoc multiple comparison test of Least Significant Difference (L.S.D.) was used to further examine the differences among means in data groups. Cochran and Cox (1957) proposed in their statement that:

> If F is not significant, no t-tests are made, the means being regarded as indistinguishable. If F is significant, the ordinary t-test for the difference between two means is applied to every pair of means. It saves time to compute the least significant difference. Any two means whose difference exceeds this value are declared significantly different. ... has examined the type of protection which this method gives the experimenter against erroneously finding significant results (p. 76).

Furthermore, Stranak (1998) relayed that the Least Significant Difference method was the most powerful in detecting true differences among means of the post-hoc analysis selections.

Objectives three through eight were analyzed using the statistical testing procedure of multiple regression analysis. For the purposes of multiple regression analysis the researcher identified starting base salary as the dependent variable (Y). Likewise, six independent variables ($x_1 \ldots x_6$) were identified as the number of internships completed, number of months spent interning, academic major upon graduation, grade point average, gender, and prior work experience.

For defining and application purposes Johnson and Tsui (1998) indicated that multiple regression analysis:

> Concerns the study of relationships between variables with the object of identifying, estimating, and validating the relationship. The estimated relationship can then be used to predict one variable from the value of the variables(s) (p. 504).

In a supplementary fashion, correlation matrices were used with regression computations to determine relationships between variables as well as to review for multi-collinearity.

Analysis of data were performed using the computer program (SPSS) Statistical Package for the Social Sciences Version 8.0. All statistical data were processed using a Gateway 2000 P5-120 computer system and reviewed for completeness by Dr. Linn Stranak of The University of Memphis (Tennessee).

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The purpose of this chapter was to present in detail the analysis of the data applicable to the purpose and objectives of the study. In addition, descriptive illustrations and statistical data relevant to the data will be provided for supporting information for the benefit of the Murray State University Department of Agriculture.

Population of the Study

The population of the study was comprised of 417 graduates of the Murray State University Department of Agriculture that had obtained Bachelor of Science degrees in an agricultural discipline between the years of 1992-1997. The population was identified and located using departmental records in conjunction with the Murray State University Alumni Relations Office.

The research gathering technique involved the use of a mailed survey to all graduates and a follow-up survey mailed approximately four weeks after the initial mailing. Due to the sensitivity of the data, the presence of frequent forwarding addresses, relocation of graduates, and non-current telephone numbers the researcher concluded after an additional attempt by telephone that there was no optimal approach or effective manner in which to further contact individual members of the study population.

Response Rate

Of the 417 graduates surveyed approximately 195 returned completed surveys applicable for data entry. This resulted in a 46.76 percent total response rate for the study. This 46.76 percent response rate was determined to be comparable to similar studies which were addressed in Chapter One.

Findings of the Study

Demographics

The following data and tables, corresponding to Objective One of the study, are displayed using descriptive statistics describing the 195 respondents of the study. The data presented serves as both an introduction to the descriptive findings of the respondents participating in the study, as well as to provide detailed programmatic information applicable to faculty of the Department of Agriculture at Murray State University.

The descriptive statistics revealed that among the 195 total respondents 103 (52.8%) reported completion of at least one internship experience. In addition, data indicated that 133 of the 195 (57.9%) respondents to the study were male, while 82 (42.1%) were female.

Table I displays the distribution of all 195 non-internship and internship completing respondents categorized by academic major within the Department of Agriculture. As can be seen graduates who majored in Agricultural Business were the

most predominate of all respondents with 66 out of the 195 (33.8 %). The second most predominate group of respondents were from the major of Animal Health Technology. This group reported 19.5 percent or 38 of the total 195 responses.

TABLE I

A DISTRIBUTION OF NON-INTERNSHIP & INTERNSHIP RESPONDENTS BY ACADEMIC MAJOR

Academic Major	N=195	Percentage (%)
Agribusiness	66	33.80
Pre-Veterinary Medicine	12	6.20
Agronomy/Crops	14	7.20
Agricultural Mechanization	10	5.10
Agricultural Communication	1.0	0.50
Horticulture	11	5.60
Animal Health Tech.	38	19.50
Animal Science	19	9.70
Agricultural Education	15	7.70
Agricultural Science	9.0	4.60
Total	195	100

Table II displays the distribution of respondents of the study by number of internships completed. As can be seen almost one-half (47.2 %) of the respondents did not complete an internship while 40 percent completed at least one internship experience. Table II also indicated that 11.8 percent of respondents completed two internships while only 1.0 percent reporting completion of three or more. Among all 195 respondents 103 (52.8%) reported completion of at least one internship or cooperative education experience.

TABLE II

A DISTRIBUTION OF RESPONDENTS BY NUMBER OF INTERNSHIPS COMPLETED

Number of Internships	N = 195	Percentage (%)	Cumulative Percentage (%)
0	92	47.2	47.2
1	78	40.0	87.2
2	23	11.8	99.0
3	2	1.0	100
Total	195	100	

The data in Table III reveals the starting base salaries of all 195 responding graduates categorized by academic major. Among the ten selections available, graduates in Agricultural Education had the highest mean starting salary. Graduates in Agricultural Education reported an average of $25,066.67 during the first year of employment with a salary range of $10,000 to $30,000. Among all graduates, those reporting the second highest mean salary were Agricultural Business graduates reporting $24,166.67 in their first year of employment. Likewise, and before declining steadily, Agricultural Mechanization graduates reported mean starting incomes of $23,400.00.

On the opposite end of the spectrum the lowest starting salaries were reported from graduates of the Animal Health Technology program. As indicated in Table III, graduates from Animal Health Technology reported a mean starting salary of $16,710.53. Among all graduates from the Murray State University Department of Agriculture a mean starting salary of $21,225.64 was reported with a standard deviation of $7,374.00.

The data in Table IV described the average starting salary by all respondents when categorized by gender. Here it can be seen that the mean starting salary reported by all 113 male graduates was $23,707.96, some six thousand dollars above the 82 female graduates who reported averaging $17,804.88 between 1992 and 1997. However, starting salary ranges for the two groups were moderately comparable. In Table IV it was shown that males reported a high of $50,000 and females $46,000 in starting salary.

TABLE III

A DISTRIBUTION OF MEAN STARTING SALARIES
CATEGORIZED BY ACADEMIC MAJOR

Academic Major N=195	Mean Salary ($)	Standard Deviation ($)	Minimum ($)	Maximum ($)
Agricultural Business	24,166.67	6,911.71	11,000.00	50,000.00
Pre-Veterinary Medicine	19,750.00	11,062.84	10,000.00	36,000.00
Agronomy/Crops	20,642.86	5,812.55	10,000.00	30,000.00
Agricultural Mechanization	23,400.00	6,736.30	10,000.00	36,000.00
Horticulture	19,818.18	11,258.94	10,000.00	46,000.00
Animal Health Technology	16,710.53	4,549.48	10,000.00	26,000.00
Animal Science	19,157.89	7,002.08	10,000.00	32,000.00
Agricultural Education	25,066.67	5,006.66	10,000.00	30,000.00
Agricultural Science	19,333.33	4,769.70	10,000.00	24,000.00
Total Average	21,225.64	7,374.00		

TABLE IV

A DISTRIBUTION OF AVERAGE STARTING SALARIES AS REPORTED
BY RESPONDENTS CATEGORIZED BY GENDER

Gender	N = 195	Mean Salary ($)	Standard Deviation ($)	Minimum ($)	Maximum ($)
Male Respondents		23,707.96	7,079.50	10,000.00	50,000.00
Female Respondents		17,804.88	6,360.47	10,000.00	46,000.00

The date exhibited in Table V indicated the mean number of internships completed by all respondents categorized by academic major. Mean tabulations indicated that Animal Health Technology graduates completed 0.95 internships while Agricultural Education graduates completed an average of 0.93 internship experiences.

TABLE V

A DISTRIBUTION OF MEAN NUMBER OF INTERNSHIPS COMPLETED BY RESPONDENTS BY ACADEMIC MAJOR

Academic Major N=195	Mean	Standard Deviation	Minimum	Maximum
Agricultural Business	0.5455	0.8073	0	3
Pre-Veterinary Medicine	0.5833	0.5149	0	1
Agronomy/Crops	.07857	1.051	0	3
Agricultural Mechanization	0.7000	0.8233 0	0	2
Horticulture	0.6364	0.809	0	2
Animal Health Technology	0.9474	0.3244	0	2
Animal Science	0.4737	0.7723	0	2
Agricultural Education	0.9333	0.4577	0	2
Agricultural Science	0.3333	0.7011	0	2
Total Average	0.6667	0.7227		

Moreover, Agricultural Business, which was reported to have the second highest starting base salary, averaged only 0.55 internship experiences. The two academic majors

with the least number of internship experiences were included Agricultural Science with 0.33 and .047 internship experiences in Animal Science.

The date in Table VI illustrated the mean number of months the respondents spent in their internship programs as categorized by academic major. The results indicated that Animal Health Technology graduates reported on average of spending 3.87 months in their first internship experience. Furthermore, Agricultural Education and Agricultural Mechanization graduates reported 2.87 months and 2.80 months respectively being spent in their first internship experience.

Shortest time period spent in the first internship among all majors were the graduates in Agricultural Business and Agricultural Science each reporting 1.32 and 1.44 months of interning respectively. The minimum and maximum length of internships ranged from a low of zero months to a high of 12 months or one full year. Among all graduates in all academic majors the average length of time spent in the first internship experience was determined to be 2.20 months, or comparatively the length of time between spring and fall academic semesters.

Further calculations were made in order to examine the average number of months graduates spent in their first internship experience categorized by gender. Assimilation of Table VII indicated that male respondents reported spending on average 2.04 months in their first internship experience, while female respondents reported a mean of 2.43 months. This difference in gender can be partially explained by the large number of females who elect to major in Animal Health Technology.

TABLE VI

A DISTRIBUTION OF MEAN NUMBER OF MONTHS SPENT IN THE INTERNSHIP EXPERIENCE BY ACADEMIC MAJOR

Academic Major N=103	Mean	Standard Deviation	Minimum	Maximum
Agricultural Business	1.3182	2.3082	0	12
Pre-Veterinary Medicine	2.0000	1.8091	0	4
Agronomy/Crops	2.5714	3.9363	0	12
Agricultural Mechanization	2.8000	3.4254	0	10
Horticulture	1.6364	1.9633	0	5
Animal Health Technology	3.8684	2.6424	0	12
Animal Science	1.7368	3.4935	0	12
Agricultural Education	2.8667	2.1336	0	9
Agricultural Science	1.4444	3.1269	0	9
Total Average	2.2000	2.8131		

TABLE VII

A DISTRIBUTION OF THE MEAN NUMBER OF MONTHS SPENT IN FIRST INTERNSHIP EXPERIENCE BY GENDER

Gender	N = 103	Mean	Standard Deviation	Minimum	Maximum
Male Respondents		2.0354	3.0587	0	12
Female Respondents		2.4268	2.4345	0	12

The date in Table VIII summarized the average grade point average reported by all respondents and categorized by academic major. Among the ten academic majors, Agricultural Science respondents reported the highest mean grade point average of 3.24 with graduates of Pre-Veterinary Medicine following a close second reporting 3.23.

The lowest grade point averages among all graduates by major were calculated as 3.09 for Agricultural Education and 2.98 for Animal Science graduates. Further assimilation of the data in Table VIII revealed that the mean overall grade point average for all graduates of the Department of Agriculture was 3.13 with a standard deviation of 0.408.

The data in Table IX described the mean grade point average of all 195 respondents by number of internships completed. Among those respondents classified as traditional graduates and who did not complete an internship experience the mean grade point average was found to be 3.09. On the other hand, graduates reporting the completion of one internship experience reported a slightly higher grade point average of 3.18 with a standard deviation of 0.4023. However, those graduates who indicated they had completed two internships indicated a mean GPA of 3.16 which was slightly lower than those with one internship. Furthermore, graduates who had completed three internship experiences were found to have had a mean grade point average of 3.00, which was somewhat of a regression from those completing one or two experiences. Conclusively, and referring only to Table IX of this study, one might deduct that students in the Department of Agriculture who complete one or two internship experiences do somewhat better with respect to academic grade point average.

TABLE VIII

A DISTRIBUTION OF MEAN GRADE POINT AVERAGES FOR ALL RESPONDENTS BY ACADEMIC MAJOR

Academic Major N=195	Mean	Standard Deviation	Minimum	Maximum
Agricultural Business	3.1477	0.4268	2.13	3.68
Pre-Veterinary Medicine	3.2292	0.3100	2.88	3.88
Agronomy/Crops	3.1250	0.4385	2.63	3.88
Agricultural Mechanization	3.2250	0.4116	2.63	3.88
Horticulture	3.1705	0.4447	2.13	3.88
Animal Health Technology	3.1263	0.4264	2.13	3.88
Animal Science	2.9829	0.4001	2.38	3.88
Agricultural Education	3.0917	0.3389	2.62	3.63
Agricultural Science	3.2361	0.4167	2.38	3.63
Total Average	3.1345	0.4084		

TABLE IX

A DISTRIBUTION OF THE MEAN GRADE POINT AVERAGES AMONG ALL RESPONDENTS BY NUMBER OF INTERNSHIPS

Number of Internships	Mean	Standard Deviation	Minimum	Maximum
0	3.0902	0.3891	2.13	3.88
1	3.1833	0.4023	2.13	3.88
2	3.1576	0.4960	2.38	3.88
3	3.0000	0.5303	2.63	3.88

The data in Table X showed the mean grade point averages categorized by gender for all 195 respondents. The results revealed that females achieved higher grade point averages over males for all majors. Results depicted in Table X indicated that male respondents reported a mean grade point average of 3.11 with a standard deviation of 0.4118, while female respondents earned a mean grade point average of 3.17 with a standard deviation of 0.4037. Both males and females reported a minimum grade point average of 2.13 and a maximum of 3.88 when using the instruments' interval range of .25.

TABLE X

A DISTRIBUTION OF THE MEAN GRADE POINT AVERAGES AMONG STUDY RESPONDENTS AS INDICATED BY GENDER

Gender	Mean	Standard Deviation	Minimum	Maximum
Male Respondents	3.11	0.4118	2.13	3.88
Female Respondents	3.1683	0.4037	2.13	3.88

The data described in Table XI exhibited a frequency distribution of the classification of the 103 intern respondents in their first internship experience. A review of Table XI indicates that roughly one-half, or 48.5 percent of all 103 graduates completing internships do so in their senior year, while 45 (43.7%) do so while still in

their junior year of study. The cumulative percentage of graduates who responded as completing their first internship experience in their freshman or sophomore years was limited to 7.8 percent.

TABLE XI

A DISTRIBUTION OF GRADUATES IN THEIR FIRST INTERNSHIP EXPERIENCE BY ACADEMIC CLASS

Academic Year/ Classification	Number N=103	Percentage (%)
Freshman	1	0.97
Sophomore	7	6.80
Junior	45	43.7
Senior	50	48.5
Total	103	100.0

Data in Table XII, showed the number of months elapsing between graduation and acceptance of full-time employment among the 195 respondents. The average time lapse among all responding graduates within the Department of Agriculture was 3.12 months prior to accepting employment upon completion of the Bachelor of Science degree. However, several academic majors reported less time. For instance, Agricultural Mechanization graduates reported searching an average of only 1.9 months, while Agronomy and Crop science majors reported a mean of 2.14 months.

The data in Table XII also indicated it took a somewhat longer period of time to find acceptable employment for Pre-Veterinary Medicine and Animal Science graduates with 5.67 and 4.89 months respectively. The standard deviation for all majors reported was 3.54.

TABLE XII

A SUMMARY OF THE AVERAGE NUMBER OF MONTHS ELAPSING BETWEEN GRADUATION AND ACCEPTANCE OF FULL-TIME EMPLOYMENT BY ACADEMIC MAJOR

Academic Major N=195	Mean	Standard Deviation	Minimum	Maximum
Agricultural Business	2.2576	2.5918	1	12
Pre-Veterinary Medicine	5.6667	5.0151	1	12
Agronomy/Crops	2.1429	1.6104	1	6
Agricultural Mechanization	1.9000	1.5239	1	6
Horticulture	3.6364	4.5005	1	12
Animal Health Technology	2.5789	32685	1	12
Animal Science	4.8947	4.6055	1	12
Agricultural Education	4.2667	3.9364	1	12
Agricultural Science	3.8889	3.7896	1	12
Total Average	3.1179	3.5363		

The data expressed in Table XIII showed the perceived importance of the internship experience as indicated by graduate respondents in aiding them in to obtain a higher starting base salary upon graduation.

TABLE XIII

A SUMMARY OF MSU GRADUATES' PERCEPTIONS WHO COMPLETED AT LEAST ONE INTERNSHIP EXPERIENCE AND IT'S PERCEIVED IMPORTANCE IN AIDING THEM TO OBTAIN A HIGHER STARTING SALARY BY CATEGORY OF IMPORTANCE

Estimated Value	Response	Frequency	Percentage (%)	Cumulative Percentage (%)
1)	Not Important at All	10	9.7	9.7
2)	Not Very Important	11	10.7	20.4
3)	Average	26	25.2	45.6
4)	Somewhat Important	27	26.2	71.8
5)	Very Important	29	28.2	100
	Total	103	100	

A frequency of responses indicated that 9.7 percent of the 103 graduates completing at least one internship stated that the experience was "Not Important at All" in aiding them in obtaining a higher starting salary. Likewise, 10.7 percent indicated that they thought that the experience was "Not Very Important" concerning the salary issue. On the other hand, case 25.2 percent of the 103 respondents completing internships

indicated that the internship experience was "average" in importance for them in receiving a high base salary. In similar situations 26.2 percent and 28.2 percent of respondents respectively rated their experience "Somewhat Important" and "Very Important" in aiding them in increasing their starting base salary.

Further analysis revealed that the mean response concerning the perceived importance of internships was 3.5243 with a standard deviation of 1.2745.

Objectives Two-Eight

The following tables represent data synthesized for objectives two through eight of the study. As stated earlier in the study, the researcher wishes to point out that the following inferential statistics were used as an indicator to the population of graduates only and not for direct inferential purposes.

Table XIV displayed data compilations for objective two which consisted of a comparison of two group means concerning starting base salary. The two groups consisted of traditional graduates who had not completed an internship or of graduates who had completed one or more internship experiences.

Regarding differences in starting salary of graduates completing internships as compared to those not completing internships, the one-way analysis of variance yielded an F value of 0.443 which indicated significance at the 0.507 level which was far below the predetermined alpha level of .05 established by the researcher.

TABLE XIV

A ONE-WAY ANALYSIS OF VARIANCE TEST FOR SIGNIFICANCE AMONG TRADITIONAL GRADUATES AND GRADUATES REPORTING AT LEAST ONE INTERNSHIP EXPERIENCE

	Degree of Freedom	Sum of Squares	Mean Square	F Statistic	Significance
Between Groups	1	24126986.9	24126986.9	0.443	0.507*
Within Groups	193	1.05E+10	54517848.7		
Total	194	1.06E+10			

Note: * α=.05

Further analysis of the same data was conducted by the researcher with the results displayed in Table XV. The data interpretation in Table XV revealed an F statistic of 4.458 resulting from the comparison of starting base salary means among traditional graduates who had not completed an internship and those who had completed one internship experience with a third group who had reported completion of two or more internship experiences. Results of the analysis of variance test indicated that the mean differences were significant at 0.013, which was within the predetermined alpha .05 level established by the researcher.

As a result of this significance level being within the alpha .05 limitation the researcher elected to further compare the data. The Least Significant Difference test, a post-hoc multiple comparison, was utilized as an additional method to further detect the true differences between mean salaries of each of the three groups of graduates. The results of this computation were displayed in Table XVI.

TABLE XV

A ONE-WAY ANALYSIS OF VARIANCE TEST FOR SIGNIFICANCE AMONG TRADITIONAL GRADUATES AND THOSE COMPLETING ONE INTERNSHIP WITH THOSE REPORTING COMPLETION OF TWO OR MORE INTERNSHIP EXPERIENCES

	Degree of Freedom	Sum of Squares	Mean Square	F Statistic	Significance
Between Groups	2	467997358	233998679	4.458	0.013*
Within Groups	192	1.01E+10	52489971		
Total	194	1.06E+10			

Note: *α=.05

TABLE XVI

POST-HOC LEAST SIGNIFICANT DIFFERENCE TEST OF MEANS AMONG TRADITIONAL GRADUATES AND THOSE COMPLETING ONE INTERNSHIP WITH THOSE REPORTING COMPLETION OF TWO OR MORE INTERNSHIP EXPERIENCES

Number of Internships	Number of Internships	Mean Difference	Significance
0	1	1879.8774	0.093
0	2+	-2962.1739	0.071
1	2+	-4842.0513	0.004 *

Note: *α=.05

Interpretation of the data revealed in Table XVI indicated significance at the 0.004 level between graduates' completing one internship and those reporting completion of two or more internship experiences. However, no significant difference in starting base salary was detected between traditional graduates not completing an internship and those completing one internship, or with traditional graduates completing no internships and those completing two or more internships.

The following data encompasses objectives three through eight of the study. Analysis of the data were accomplished using a variety of gambits. The first analysis was a direct production of the statistical computation of Least Squares Multiple Linear Regression.

An interpretation of the regression model summary validated an R score of 0.490 when using the following six independent predictor variables: 1) number of internships completed, 2) numbers of months spent in first internship, 3) a selection of academic majors or specialization's, 4) grade point average, gender, 5) number of years employed between high school graduation, and 6) completion of the Bachelor of Science degree.

The R score, or the multiple correlation coefficient, reports the degree of relationship between the dependent variable of starting base salary and the six identified independent variables. Therefore, it may be concluded that an R score of 0.490 expresses a moderate degree among relationship of the six independent variables to starting base salary given the scope of the study and the size of the population.

The model also reported an R square, or coefficient of multiple determination, of 0.240. The R square of the model similarly reports the degree of commonality, or the

error reduction in the prediction equation. Therefore, it might be concluded that there can only be a 0.240 chance at reducing error in the model.

The model also indicated an adjusted R square component of 0.181. The adjusted R square component expresses the degree to which the sample data fits the population. In this case, 0.181 exhibited a relatively low degree within its relationship to the population as a whole.

The results of analysis of variance within the regression model can be viewed in Table XVII. The data in Table XVII indicated that the F statistic was 4.066 and therefore yielded a significance of 0.000, which subsequently was well below the alpha .05 level determined by the researcher. This level of significance further allowed the researcher to conclude that the regression model was indeed effective in identifying sources of variability and thereupon allowed the regression model to be accepted as a viable tool to be used for prediction purposes.

TABLE XVII

ANALYSIS OF VARIANCE WITHIN THE MULTIPLE REGRESSION MODEL AND THE SIX INDEPENDENT VARIABLES AND DEPENDENT VARIABLE PREDICTING STARTING BASE SALARY

Model	Sum of Squares	Degrees of Freedom	Mean Square	F Statistic	Significance
Regression	2.53E+09	14	1809676194	4.066	0.000 *
Residual	8.01E+09	180	44513361.5		
Total	1.06E+10	194			

Note: *α=.05

Further results of the same data included the interpretation of the beta coefficients, t-scores, and significance level of each of the predictor variables. The data seen in Table XVIII, seen later in this chapter, revealed the results of these compilations. In interpretation of this coefficient summary, it should be noted that among the six independent variables identified in an earlier part of this study, the one of academic major was broken down into ten components to further express their actual representation. In interpretation of the beta coefficients, the researcher chose to use the standardized beta coefficient tabulations which were identified and referred to below as the positive/negative relative change expressed using the constant as a base identifier. Each variable's relative change may be constructed by multiplying the constant by the standardized beta coefficient.

As results indicated, the model expresses a constant of $14,071.16 in a graduates' starting base salary. Further interpretation of the table validated that the only independent variable meeting the alpha .05 window of significance was the male gender, which consequently exhibited the largest relative change in salary addition of .293. The number of internships completed by students, which was a primary premise of the study, only constituted a relative change of .144 in additional salary to a graduate in their first position. Likewise, the number of months spent in the first internship experience had a negative relative change, or a reduction in salary, of -.12 as expressed by the constant for every month spent in the first internship.

Grade point average, which was a major finding in Gardner et al's (1992) study, only exhibited a relative change of .046 and was not significant at alpha = .05 level. The last independent variable, excluding those of academic major, were number of years

employed between high school graduation and completion of the Bachelor of Science degree. This indicator yielded a rather low relative change of .047 per year of work experience.

Among the ten academic majors available at Murray State University Department of Agriculture, none were reported as being significant at the alpha .05 level utilizing the Least Squares Method of Multiple Linear Regression. However, in analyzing the 195 respondents participating in the study, the major of Agricultural Education had the highest relative change with .153 being added to a graduates' starting base salary. The second highest addition to starting salary was determined to be among Agricultural Business majors which had a relative change of .203 in additional salary. The third highest, and the last reported amount prior to a steady regression was Agricultural Mechanization which accounted for a positive relative change of .048 in salary.

Two other academic majors also reported a positive dollar amount change as a result of their standardized beta coefficient's. Interpretations of the Horticulture variable indicated a graduate could expect a moderate relative change of .015 added to starting base salary. Likewise, along similar areas, Agronomy and Crop Science graduates could reasonably anticipate a relative change of approximately .011 in additional salary along with the other calculated variables within the regression equation.

TABLE XVIII

A SUMMARY OF RELATIONSHIPS AMONG SIX INDEPENDENT VARIABLES AND STARTING BASE SALARY OF RESPONDENTS AS DETERMINED BY LEAST SQUARES MULTIPLE LINEAR REGRESSION BETA COEFFICIENT MODEL BY VARIABLE

Variable N=195	Relative Change $	Standard Error $	T Statistic	Significance
Constant	$14,071.16	7556.951	1.862	0.064
Number Internships	0.144	910.223	1.614	0.108
Months Interning	-0.120	240.929	-1.307	0.193
Agricultural Business	0.203	6807.599	0.463	0.644
Pre-Veterinary Medicine	-0.003	6998.182	-0.012	0.990
Agronomy/Crops	0.011	6974.875	0.045	0.964
Agricultural	0.048	7131.484	0.224	0.823
Horticulture	0.015	7004.405	0.071	0.944
Animal Health	-0.053	6806.737	-0.143	0.886
Animal Science	-0.049	6907.057	-0.177	0.860
Agricultural Education	0.153	6977.694	0.607	0.545
Agricultural Science	-0.024	7099.231	-0.116	0.908
Grade Point Average	0.046	1199.512	0.698	0.486
Gender (If Male)	0.296	1217.450	3.584	* 0.000
Years Employed	0.047	185.372	0.704	0.483

Note: *Significant at the .05 level

The lowest among academic majors responding, and having a negative function with respect to the starting base salary of a graduate from the Department of Agriculture, were Animal Science; Animal Health Technology; Agricultural Science; and Pre-Veterinary Medicine with relative changes of -.049, -.053, -.024, and -.012 respectively.

Concluding from the significance detected in the analysis of variance test within the regression model, the above relative changes of salary in Table XVIII may be constructed to produce a significant regression equation. The full regression equation using unstandardized whole number beta coefficients for the Least Squares Method of Multiple Regression analysis may be observed in Exhibit A in the appendices of this study. Furthermore, the model was verified by the analysis of variance test as a pertinent source in predicting the starting base salary of graduates' from the Murray State University Department of Agriculture.

For the purposes of observing the prior Least Squares regression model for multicollinearity, or the overlap or closeness of variables, the researcher elected to further construct a correlation matrix in order to determine the most optimum predictors of starting base salary. Results of the correlation matrix indicated that significance was found within the .05 level with gender and Agricultural Business (.302), and with gender and Agricultural Mechanization (.198). Also identified as a negative for starting salary (-.525) was gender among graduates and the academic major of Animal Health Technology. Furthermore, gender and the dependent variable of starting salary were also determined to be significant at the .05 level with a correlation tabulation of .396.

The dependent variable of starting salary was also observed for correlation with the independent variables. Results indicated that salary and Agricultural Business posted

the highest tabulated correlation score of .286, and Animal Health Technology posted the lowest negative score of -.302, making both the academic major and starting salary significant at the .05 level. The major of Agricultural Education was also significant with a tabulated correlation score of .151. Likewise, starting salary and gender were found to be significant at the .05 level with a correlational score of .396.

In summary of the previous Least Squares Multiple Regression coefficients in Table XVIII, gender was pinpointed as being the only compelling predictor of starting base salary. Moreover, and in the presence of numerous independent variables, the researcher elected to run the additional statistical testing method of Backwards Stepwise Multiple Regression analysis using the same data to further increase the sensitivity of the testing applications.

In analyzing backwards stepwise regression each of the variables were backed out, or excluded, one at a time from the equation in order to identify the ones with the most predicting ability. The data in Table XVIV illustrates the model summary for the data synthesized utilizing backwards multiple regression analysis. As can be observed from the data shown in Table XVIV, the R score begins to decrease as each variable was backed out of the application. In the researchers' interpretation of the backwards multiple regression model summary, it was determined that the optimal predictors were established within the eighth model calculation.

This was determined by observing both the beta coefficient tabulations, which may be referenced in the appendixes of this study, as well as the relative reduction of R square in the model summary from 0.486 in the seventh model calculation to that of 0.484 in the eighth.

TABLE XVIV

A SUMMARY OF RELATIONSHIPS AMONG SIX INDEPENDENT VARIABLES AND STARTING BASE SALARY OF RESPONDENTS AS DETERMINED BY BACKWARDS STEPWISE MULTIPLE REGRESSION MODELS

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
1	0.490	0.240	0.181	6671.8334
2	0.490	0.240	0.186	6653.3802
3	0.490	0.240	0.190	6635.4965
4	0.490	0.240	0.194	6617.7850
5	0.489	0.239	0.198	6603.0321
6	0.487	0.238	0.200	6592.6574
7	0.486	0.236	0.204	6579.7337
8	0.484	0.235	0.206	6569.8562
9	0.482	0.232	0.208	6562.5882
10	0.478	0.228	0.208	6561.2623
11	0.468	0.219	0.202	6584.9459
12	0.463	0.214	0.202	6586.8015

Note: 1) Predictors: (constant) agbus, gpa, employ, numintern, mech, hort, vet, agsci, agron/crop, ed, gen, animal, months, antech 2) Predictors: (constant) agbus, gpa, employ, numintern, mech, hort, agsci, agron/crop, ed, gend, animal, months, antech 3) Predictors: (constant) agbus, gpa, employ, numintern, mech, hort, agsci, ed, gender, animal, months, antech 4) Predictors: (constant) agbus, gpa, employ, numintern, mech, agsci, ed, gend, animal, months, antech 5) Predictors: (constant) agbus, gpa, employ, numintern, mech, ed, gend, animal, months, antech 6) Predictors: (constant) agbus, gpa, employ, numintern, mech, ed, gend, animal, months 7) Predictors: (constant) agbus, gpa, employ, numintern, mech, ed, gend, months 8) Predictors: (constant) agbus, gpa, numintern, mech, ed, gend, months 9) Predictors: (constant) agbus, numintern, mech, ed, gend, months 10) Predictors: (constant) agbus, numintern, ed, gend, months 11) Predictors: (constant) agbus, numintern, ed, gend 12) Predictors: (constant) agbus, ed, gend

In pinpointing the most optimum model for variable application and prediction purposes, the researcher elected to use model number eight. In using model eight, the researcher identified beta coefficient tabulations in which the number of internships yielded a t-score of 1.770 and a significance level of 0.078, subsequently providing statistical validation that number of internships was not significant at the.05 level.

However, due to its comparable proximity to the alpha .05 level of significance, and the relative premise of internships within this study, the researcher elected to include it in the revised backwards multiple regression equation. Comparatively, several other variables in model eight indicated that significance was present at the .05 level. Among the academic majors Agricultural Education yielded a significance level of 0.013 and Agricultural Business indicated a 0.002 level of significance. On the other hand, gender, and specifically male graduates, revealed a t-score of 4.198 and a significance level of 0.000.

Further interpretation of the model eight beta coefficients, which again may be referenced in the appendices of this study, shows that the beta coefficients' constant drops only minimally from $14,071.16 in the prior Least Squares Regression model discussed earlier in Table XVIII, to that of $13,924.63 in the coefficient determined in model eight.

In observing the analysis of variance model summary within the backwards stepwise regression calculations, it can also be seen that all F statistics were significant within the predetermined .05 alpha level. Therefore, in assessing the significance levels of the beta coefficients in model eight, and given the previous information, the Backwards Stepwise Multiple Regression equation shown in Exhibit B in the appendixes

of this study may be used to more accurately predict a graduates starting base salary than the Least Squares Regression Method.

In summary, the purpose of Chapter IV was to show the reader the outcomes and significance levels of each of the statistical computations performed throughout the research study. An additional purpose of the chapter was to illustrate a descriptive representation of the data to the faculty and administration of the Murray State University Department of Agriculture.

CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND IMPLICATIONS

Summary

As educators and university graduates alike approach the 21st century we need to be aware of the value and limitations of cooperative education and internship experiences. Just as corporations, institutions, and governmental agencies heightened the awareness of internships back in the 1950's and 1960's, the same magnitude of interest is brewing in today's agricultural sector.

Recently a division of the United States Department of Agriculture, the Agricultural Cooperative Service (ACS), and the National Council of Farmer Cooperatives (NCFC) conducted a series of surveys and meetings to begin investigating the relative effects of cooperative education on agricultural students (USDA, 1992). Furthermore, universities and agencies have begun to correspond with research of their own in investigating the economic and non-economic benefits of cooperative education in agriculture to both students and their institutions and agencies.

Reiterating the philosophical foundations in education of John Dewey, Heineman (1982) and De Falco (1990) which emphasize the role that institutions should take in

providing assistance in fulfilling student's educational experience. Furthermore, Dewey postulated that universities should utilize all of their resources to equip students with the tools to control their future economic careers, which in this case one might argue for increased study and use of internships and cooperative education in providing those tools. Therefore, this study maintained as an underlying basis an attempt to provide a substantial amount of information concerning the relative economic/salary based information data which would be necessary in guiding cooperative education and internship programs in agriculture at Murray State University.

Problem

While many of today's undergraduate agriculture students choose to take advantage of industry-related internships and cooperative work experiences, many do not. Likewise, due to the lack of specific information concerning the fundamental value of undergraduate internships, those working with related programs in university settings have little information with which to quantify important program management decisions. In addition, agriculture students and faculty alike have the need to be well informed of critical information which may ultimately affect the income or economic earning potential within the early part of our graduates careers.

For this reason, the researcher chose to conduct a detailed comparison of students completing undergraduate agricultural internships versus traditional non-interning graduates to determine which route best serves their starting base salary or income earning potential.

Purpose of the Study

The purpose of the study was to determine and compare if there was a relationship between starting base salaries, number of internships, and selected other variables among agricultural graduates from Murray State University for the period 1992-1997.

Objectives of the Study

In order to achieve the purpose of the study, the following objectives were established:

1) To determine selected demographics of Murray State University Agriculture graduates between 1992-1997.
2) To compare starting base salaries of graduates from Murray State University with a Bachelor of Science degree in an agricultural discipline who had completed one or more internships with graduates who followed the traditional non-internship route.
3) To determine if the number of internships completed had a relationship to the graduates' starting base salary.
4) To determine if the number of months spent in the internship had a relationship to the graduates' starting base salary.
5) To determine if the academic major upon graduation had a relationship to the graduates' starting base salary.

6) To determine if grade point average upon graduation had a relationship to the graduates' starting base salary.

7) To determine if gender had a relationship to the graduates' starting base salary.

8) To determine if prior work experience had a relationship to the graduates' starting base salary.

Population of the Study

The population of the study was comprised of 417 graduates of the Murray State University Department of Agriculture that had obtained Bachelor of Science degree's in an agricultural discipline between the years of 1992-1997. The population was identified and located using departmental records in conjunction with the Murray State University Alumni Relations Office.

Response Rate

Of the 417 graduates surveyed approximately 195 returned completed surveys resulting in a 46.76 percent response rate for the study.

Summary of the Findings

Demographics

In achieving the objectives of the study the researcher chose to utilize descriptive statistics to portray the make-up of the respondents participating in the study. A summary of this data disclosed almost 53 percent of the respondents reported completion of at least one internship experience while completing their Bachelor of Science degree. Further observations indicated that 40 percent completed one internship, while almost 12 percent completed two internships, and 1.0 percent of the study respondents completed three or more internships.

Additional data computations of the respondents demographics revealed that the mean starting base salary of graduates from the Murray State University Department of Agriculture was $21,225.00 with a standard deviation of $7,374. The data also confirmed that the highest mean starting salaries were reported among Agricultural Education graduates and Agricultural Business graduates at $25,066.67 and $24,166.67 respectively. For respondents to the study, the lowest mean salary was reported among Animal Health Technology graduates. The same data also indicated that male graduates earned just over $6000 more than their female counterparts. Calculations also indicated that Animal Health Technology graduates completed an average of 0.95 internships ranking highest among the ten possible agricultural disciplines at Murray State University. On the opposite end of the same spectrum Agricultural Science graduates in this study completed the least number of internships among all respondents to the study.

Data were further analyzed to determine the relationship of the respondents' grade point averages by number of internships completed. Results indicated that this relationship seemed to be moderately consistent with the review of literature in other academic areas. The mean grade point average among those completing one internship experience was slightly higher than those who did not elect to complete an internship. Likewise, those who completed two internships also reported higher grade point averages than Department of Agriculture graduates who did not participate in an internship.

The analysis of data also indicated almost 48 percent of the graduates reported completing their first internship during their senior year of college, while nearly 44 percent of respondents reported completion of the internship experience in their junior year.

Further indications revealed that Pre-Veterinary Medicine graduates required the longest period of time to acquire employment after graduation. The shortest reported length of time required for graduates from an academic major to acquire full time employment upon graduation were Agricultural Mechanization majors who reported taking almost two months on average to identify and accept a position.

Respondents' opinions of the relative importance of internships in aiding them to obtain a higher starting salary upon graduation, showed that roughly 54 percent reported that the internship experience was considered "somewhat" to "very important" in obtaining a higher starting base salary upon graduation.

Objectives Two-Eight

In comparing data pertinent to the study variable, the researcher utilized One-way Analysis of Variance. Results of the comparison concerning salary of non-interning graduates compared to respondents completing one or more internships indicated that no significant difference existed between the two groups of respondents. In comparing salaries of traditional graduates, those completing one internship, and those reporting completion of two or more internships a significant difference was determined at the alpha .05 level. Further testing of the data using Least Significant Difference indicated that a significant difference was also present between those respondents completing one internship and those completing two internship experiences.

For the purposes of further analyzing data for a relationship to the dependent variable of starting salary the researcher elected to use the Least Squares Multiple Linear Regression. Results from treatment of the data revealed a moderate R score of 0.490 and a moderate to low R square of 0.240 given the size and scope of the study population.

Further interpretation of the significance in the analysis of variance test within the regression calculation revealed that the beta coefficients, or the relative change, could be used as a viable source of prediction and in constructing the regression equation.

The researcher again chose to analyze the same data using the statistical procedure of Backwards Stepwise Multiple Regression. Results of this testing procedure were conducted and the prediction ability was validated with the acceptance of the analysis of variance test. In addition, model number eight, which may be viewed in the appendixes of the study, was identified as the optimal model to use given the R score of the model and

number of independent variables being significant at alpha = .05 level. The researcher also pointed out in the full analysis of data that the t-test for the number of internships completed was determined not to be within the .05 predetermined level of significance. However, due to its relative proximity to the desired alpha level, as well as its premise in the content of this study, the researcher elected to include it in the revised regression equation. The researcher was also able to interpret that the independent variables of which included number of internships, academic major and gender were the most apparent sources of prediction among the original variables analyzed in the Least Squares Multiple Regression model.

Major Findings of the Study

The following major findings were identified from the results of the study. From the data collected on respondents to the study, it was indicated that 58 percent of the study respondents were male. In addition, it was determined that the mean length of a first internship was 2.2 months among study respondents with a range of zero to a maximum of 12 months spent in the first internship.

Furthermore, it was determined that the mean grade point average for respondents of the study was a 3.13 gpa, while students who conducted that one internship earned the highest grade point averages among respondents completing internships. It was further revealed that over 92 percent of all respondents completing an internship did so in either their junior or senior year.

Additional findings indicated that over 50 percent of all respondents completing an internship rated the importance of it "somewhat important" to "very important" in aiding them to obtain a higher starting salary upon graduation. On the other hand, less than 21 percent of respondents in the study indicated that the experience was "not important" to the success of their starting salaries.

Conclusively, it was reported that the number of internships completed, academic major, and gender were the most apparent predictors of starting base salary among respondents to the study.

Conclusions of the Study

After examination and interpretation of study data, the researcher was able to conclude with the following and provide statistical validation to the purpose and objectives based upon the study respondents. Therefore, the following conclusions were made with respect to the major findings of the study:

1) There was no significant difference in starting base salary among traditional non-internship graduates and graduates completing one or more internships.
2) However, it was apparent that those graduates completing two or more internship experiences have a greater possibility of obtaining a higher starting base salary upon graduation.

3) Among the study respondents, it seems to be apparent that the starting base salary was a function of the number of internships, academic major, and gender.

4) It was apparent among the respondents that males had a substantial advantage over female graduates in obtaining a higher starting base salary.

Recommendations of the Study

As a result of the findings and conclusions of the study, the researcher made the following recommendations:

1) It was recommended that undergraduate students at Murray State University Department of Agriculture carefully consider completing two or more cooperative education/internships to increase the potential of adding value to their starting base salary upon graduation

2) It was also highly recommended that undergraduate students in the Department of Agriculture consider their optimal combination of variables which included cumulative grade point average, number of internships conducted, academic major, and number of months in the internship experience in further adding value to their potential starting base salary upon graduation.

3) It was recommended that Animal Health Technology undergraduates, the lowest earners of all graduates, consider additional combinations of factors which will aid them in increasing starting base salary.

4) It was recommended that undergraduate students complete at least one internship experience in order to derive the perceived effects of an increase in cumulative grade point average.

5) It was also highly recommended that undergraduate students begin to take advantage of opportunities to begin their first internship in the sophomore year of study to enable additional flexibility in time to complete two or more internship experiences.

6) Conclusively, it was recommended that the Department of Agriculture and the University as a whole take further steps to encourage undergraduate agriculture students to pursue cooperative education/internships, and furthermore facilitate a positive perception that internships do in fact increase certain economic benefits upon graduation.

Summary and Recommendations for Continued Research

As educators and undergraduate students alike enter the 21st century, we must consider the localized impact that cooperative education/internship experiences have on graduates' salaries. In addition, some researchers such as Finn (1997) postulated that cooperative education and internships should be conceptualized and formed as a discipline in all universities to further initiate and increase their perceived advantageous characteristics.

However, aside from the rhetoric of nationally mandated acceptance, the researcher recommends the following for further investigation as to the localized affects of internships at Murray State University.

1) Investigation of the impact on starting base salary of graduates from particular Department of Agriculture programs who complete specialized internships.
2) A comparison of internship experiences in relation to size, scope, location, and specialization of companies and agencies with which students intern.
3) The long term economic or salary advantages of graduates who complete cooperative education/ internships.
4) Further assessment of the optimum academic year or classification of the student in completing the first internship.
5) Additional studies should also determine and compare internships within the Department of Agriculture to other departments within the Murray State University College of Industry and Technology, as well as with other regional agricultural departments.

Implications and Use of the Study

The implications and use of this localized research study include selected characteristics that may be utilized by Murray State University Department of Agriculture faculty and students in assessing the relative impact of internship experiences on starting base salary. Therefore, the study should be utilized to aid faculty in advising students in

determining potential value-added choices to their respective majors, classifications, and personal situations. Furthermore, the study should allow users to identify and create potential measures which have the possibility of increasing and optimizing the starting base salary of a graduate from the Murray State University Department of Agriculture.

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APPENDIXES

APPENDIX A

COVER LETTER

Murray State University

COLLEGE OF INDUSTRY AND TECHNOLOGY
DEPARTMENT OF AGRICULTURE
P O BOX 9
MURRAY KY 42071-0009
(502) 762-3327 FAX: (502) 762-3441

May 5, 1998

1-
2-
3-

Dear Agriculture Alumnus:

Congratulations! You are a "VIP" graduate of the Murray State University Department of Agriculture. At this time, we need your input and advice as a graduate of our department in aiding us in making some important decisions that will direct our programs in the future.

Enclosed you will find a short survey which has been developed by the faculty and staff to assess the factors which affect a graduates' starting base salary for their first full time position after college. Your participation in this study is needed so that we can make accurate decisions concerning our program and how to best assist future graduates.

Individual responses associated with this study will remain confidential and the data will only be reported in group form. Furthermore, your responses will not be identifiable in any way and the results of the study will be destroyed upon completion. Please take a few minutes of your time to complete the questionnaire and return it to us within a day or two. A self-addressed stamped envelope has been enclosed for your convenience.

Your responses are very important to the success of this inquiry and our programs. Once again, we thank you for your continued assistance and support of the MSU Department of Agriculture.

Sincerely,

Dr. Tony Brannon
Chairman, Department of Agriculture

Jay Morgan
Faculty, Agribusiness

Enclosure(s)

APPENDIX B

SURVEY INSTRUMENT

Murray State University

Department of Agriculture

Graduate Assessment

A Follow-up Assessment of Agriculture Graduates

All Areas / Majors In Agriculture
1998

Murray State University Department of Agriculture Graduate Assessment

Please respond to the following by filling in the blank or placing a circle around the most appropriate answer that best identifies your personal situation:

Section #1:

1. While an undergraduate student at Murray State University did you participate in an agriculturally related internship(s)? (*these include AGED Student Teaching, AGR 590 Internships in AHT, AGR 488/489 Cooperative Education, or an internship in which you received no academic course credit)

   _____ Yes (If yes, continue with Question's 2-19)
   _____ No (If no, complete Section #2 Question's 12-19 only)

2. If you answered yes to question 1; how many internships did you complete? _____

3. Did you receive academic course credit for any of the following courses for participation in your internship(s)?

   ___AGR 488 Cooperative Education ___AGR 489 Cooperative Education
   ___AGED Student Teaching Credits ___AGR 590 Animal Health Technology

4. What was your age at the time of your first internship(s)? _____

5. In which year did you complete your first internship?

   _____Freshman _____Sophomore _____Junior _____Senior

6. How many months did you spend in your first internship?

   1 month 2 3 4 5 6 7 8 9 10 11 12 months or more

7. Which one of the following best describes the area of specialization of your internship(s)?

   _____Agribusiness
   _____Agricultural Mechanization
   _____Animal Health Technology
   _____Agronomy/Crops
   _____Agricultural Extension
   _____Pre-Veterinary Medicine
   _____Animal Science
   _____Agricultural Education
   _____Agricultural Communication
   _____General Agriculture/Farming

8. Did you accept employment upon graduation in the area of specialization that you concentrated on during your internship?

   _____Yes _____No

9. Which one of the following categories best describes the daily responsibilities or content of your internship(s)?

_____Product Sales	_____Research
_____Product Development	_____Teaching
_____Surgery or Animal Health	_____Commodity Merchandising
_____Technological	_____Crop Production Agriculture
_____Mechanical	_____Animal Production Agriculture
_____Landscaping/Horticulture	Other_____

10. Which one of the following best describes the geographical area in which you completed your internship?

_____Arkansas	_____Illinois	_____Kentucky
_____Missouri	_____Tennessee	Other_____

11. Rate the importance of your internship(s) in aiding you in obtaining a higher starting base salary upon graduation.

_____Very Important (5)
_____Somewhat Important (4)
_____Average (3)
_____Not Very Important (2)
_____Not Important at All (1)

Section #2:

12. What was your area of academic specialization or major within agriculture upon graduation from Murray State University?

_____Agribusiness	_____Horticulture
_____Pre-Veterinary Medicine	_____Animal Health Technology
_____Agronomy/Crops	_____Animal Science
_____Agricultural Mechanization	_____Agricultural Education
_____Agricultural Communication	_____Agriculture Science
_____Minor in Agriculture	

13. Did you accept full-time employment upon completion of your Bachelor of Science?

_____Yes
_____No (If no why?) ___No Available Jobs ___Attended Graduate School
___Personal Choice or Continued Education

14. Which of the listed ranges best defines your starting base salary for your first full time job upon completion of your undergraduate degree. (not your current salary)

___ $10,000 or less				
___ $11,000	___ $21,000	___ $31,000	___ $41,000	___ $51,000
___ $12,000	___ $22,000	___ $32,000	___ $42,000	___ $52,000
___ $13,000	___ $23,000	___ $33,000	___ $43,000	___ $53,000
___ $14,000	___ $24,000	___ $34,000	___ $44,000	___ $54,000
___ $15,000	___ $25,000	___ $35,000	___ $45,000	___ $55,000
___ $16,000	___ $26,000	___ $36,000	___ $46,000	___ $56,000
___ $17,000	___ $27,000	___ $37,000	___ $47,000	___ $57,000
___ $18,000	___ $28,000	___ $38,000	___ $48,000	___ $58,000
___ $19,000	___ $29,000	___ $39,000	___ $49,000	___ $59,000
___ $20,000	___ $30,000	___ $40,000	___ $50,000	___ $60,000 +

15. How many months after graduation elapsed prior to your accepting full time employment?

1 month or less 2 3 4 5 6 7 8 9 10 11 12 months or more

16. Which one of the following categories best describes your grade point average upon completion of your undergraduate degree?

___ 2.0-2.25	___ 2.25-2.5	___ 2.5-2.75	___ 2.75-3.0
___ 3.0-3.25	___ 3.25-3.5	___ 3.5-3.75	___ 3.75-4.0

17. Gender: _____Male _____Female

18. Please check the most appropriate response which best describes the community where you spent the majority of your high school career?

_____ Rural (0-10,000 population)
_____ Suburban (10,000-50,000 population)
_____ Urban (50,000 or more population)

19. How many years did you hold full or part-time employment between the time you finished high school and completion of your Bachelor of Science degree? (does not include internships held)

0 years 1 2 3 4 5 6 7 8 9 10 11 12 or more years

Thank you for your cooperation and continued support of MSU Agriculture!

APPENDIX C

FOLLOW-UP LETTER

Murray State University

COLLEGE OF INDUSTRY AND TECHNOLOGY
DEPARTMENT OF AGRICULTURE
P O BOX 9
MURRAY KY 42071-0009
(502) 762-3327 FAX: (502) 762-3441

June 5, 1998

Dear Agriculture Alumnus:

Two to three weeks ago, you should have received a survey instrument concerning internships on which we were attempting to gather information. In the mailing you were asked to complete a list of questions pertaining to your status as a graduate. Our records indicate that we have not received your important reply.

We are enclosing another listing of questions for your convenience. If you have already returned yours, please disregard this. If you have not, please take this opportunity to help our department by completing the enclosed form. A self-addressed stamped envelope has been included for your convenience.

Your responses are very important to us and we value your experience as a departmental alumnus. Once again, thank you for your support of the agriculture department and our many endeavors.

Sincerely,

Dr. Tony Brannon
Chair, Department of Agriculture

Jay Morgan
Faculty, Agribusiness

Enclosure(s)

APPENDIX D

INSTITUTIONAL REVIEW BOARD APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 04-28-98 **IRB #: AG-98-041**

Proposal Title: THE EFFECTS OF UNDERGRADUATE INTERNSHIPS ON STARTING BASE SALARY: AN ASSESSMENT AND COMPARISON OF AGRICULTURE GRADUATES AT MURRAY STATE UNIVERSITY 1992-1997

Principal Investigator(s): James White, Joseph A. Morgan

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE APPROVAL PERIOD.
APPROVAL STATUS PERIOD VALID FOR DATA COLLECTION FOR A ONE CALENDAR YEAR PERIOD AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Disapproval are as follows:

Sign[illegible]

Chair of Institutional Review Board

Date: April 30, 1998

cc: Joseph A. Morgan

APPENDIX E

BACKWARDS STEPWISE MULTIPLE REGRESSION ANALYSIS, ANOVA SUMMARY AND BETA COEFFICIENT TABLES, AND EXHIBITS A & B: REGRESSION EQUATIONS

Backwards Stepwise Multiple Regression ANOVA Summary

ANOVA[m]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.534E+09	14	180976194	4.066	.000[a]
	Residual	8.012E+09	180	44513361.5		
	Total	1.055E+10	194			
2	Regression	2.534E+09	13	194896931	4.403	.000[b]
	Residual	8.012E+09	181	44267467.9		
	Total	1.055E+10	194			
3	Regression	2.533E+09	12	211053815	4.793	.000[c]
	Residual	8.013E+09	182	44029813.2		
	Total	1.055E+10	194			
4	Regression	2.532E+09	11	230142941	5.255	.000[d]
	Residual	8.014E+09	183	43795078.9		
	Total	1.055E+10	194			
5	Regression	2.524E+09	10	252366575	5.788	.000[e]
	Residual	8.022E+09	184	43600032.8		
	Total	1.055E+10	194			
6	Regression	2.505E+09	9	278376935	6.405	.000[f]
	Residual	8.041E+09	185	43463131.8		
	Total	1.055E+10	194			
7	Regression	2.494E+09	8	311699167	7.200	.000[g]
	Residual	8.052E+09	186	43292894.9		
	Total	1.055E+10	194			
8	Regression	2.475E+09	7	353512696	8.190	.000[h]
	Residual	8.071E+09	187	43163010.3		
	Total	1.055E+10	194			
9	Regression	2.449E+09	6	408228285	9.479	.000[i]
	Residual	8.097E+09	188	43067564.3		
	Total	1.055E+10	194			
10	Regression	2.410E+09	5	481918181	11.194	.000[j]
	Residual	8.136E+09	189	43050163.4		
	Total	1.055E+10	194			
11	Regression	2.307E+09	4	576846126	13.303	.000[k]
	Residual	8.239E+09	190	43361512.1		
	Total	1.055E+10	194			
12	Regression	2.259E+09	3	753118190	17.359	.000[l]
	Residual	8.287E+09	191	43385954.1		
	Total	1.055E+10	194			

a. Predictors: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, HORT, VET, AGSCI, AGCROP, EDUC, GEND, ANIMAL, MONTH, ANTECH

b. Predictors: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, HORT, AGSCI, AGCROP, EDUC, GEND, ANIMAL, MONTH, ANTECH

c. Predictors: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, HORT, AGSCI, EDUC, GEND, ANIMAL, MONTH, ANTECH

d. Predictors: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, AGSCI, EDUC, GEND, ANIMAL, MONTH, ANTECH

ANOVA[m]

e. Predictors: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, EDUC, GEND, ANIMAL, MONTH, ANTECH

f. Predictors: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, EDUC, GEND, ANIMAL, MONTH

g. Predictors: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, EDUC, GEND, MONTH

h. Predictors: (Constant), AGBUS, GPA, NUMINTER, MECH, EDUC, GEND, MONTH

i. Predictors: (Constant), AGBUS, NUMINTER, MECH, EDUC, GEND, MONTH

j. Predictors: (Constant), AGBUS, NUMINTER, EDUC, GEND, MONTH

k. Predictors: (Constant), AGBUS, NUMINTER, EDUC, GEND

l. Predictors: (Constant), AGBUS, EDUC, GEND

m. Dependent Variable: SALARY

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14071.162	7556.951		1.862	.064
	NUMINTER	1468.743	910.223	.144	1.614	.108
	MONTH	-314.910	240.929	-.120	-1.307	.193
	VET	-85.337	6998.182	-.003	-.012	.990
	AGCROP	312.534	6974.875	.011	.045	.964
	MECH	1597.705	7131.484	.048	.224	.823
	HORT	493.820	7004.405	.015	.071	.944
	ANTECH	-974.828	6806.737	-.053	-.143	.886
	ANIMAL	-1224.213	6907.057	-.049	-.177	.860
	EDUC	4235.118	6977.694	.153	.607	.545
	AGSCI	-825.368	7099.231	-.024	-.116	.908
	GPA	837.278	1199.512	.046	.698	.486
	GEND	4362.876	1217.450	.293	3.584	.000
	EMPLOY	130.416	185.372	.047	.704	.483
	AGBUS	3150.445	6807.599	.203	.463	.644
2	(Constant)	13996.654	4434.461		3.156	.002
	NUMINTER	1468.486	907.462	.144	1.618	.107
	MONTH	-314.960	240.228	-.120	-1.311	.191
	AGCROP	391.489	2586.273	.014	.151	.880
	MECH	1677.223	2878.880	.050	.583	.561
	HORT	572.424	2732.963	.018	.209	.834
	ANTECH	-896.478	2240.686	-.048	-.400	.690
	ANIMAL	-1145.365	2421.932	-.046	-.473	.637
	EDUC	4314.216	2564.434	.156	1.682	.094
	AGSCI	-746.479	2915.236	-.021	-.256	.798
	GPA	836.311	1193.579	.046	.701	.484
	GEND	4361.579	1209.441	.293	3.606	.000
	EMPLOY	130.347	184.773	.047	.705	.481
	AGBUS	3229.481	2076.027	.208	1.556	.122

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
3	(Constant)	14217.607	4176.085		3.405	.001
	NUMINTER	1475.357	903.890	.145	1.632	.104
	MONTH	-315.103	239.580	-.120	-1.315	.190
	MECH	1467.704	2517.522	.044	.583	.561
	HORT	372.688	2386.887	.012	.156	.876
	ANTECH	-1094.085	1816.234	-.059	-.602	.548
	ANIMAL	-1347.975	2013.037	-.054	-.670	.504
	EDUC	4105.571	2156.697	.149	1.904	.059
	AGSCI	-950.607	2577.642	-.027	-.369	.713
	GPA	830.022	1189.650	.046	.698	.486
	GEND	4375.115	1202.889	.294	3.637	.000
	EMPLOY	128.072	183.666	.046	.697	.486
	AGBUS	3022.577	1558.358	.194	1.940	.054
4	(Constant)	14336.559	4095.048		3.501	.001
	NUMINTER	1479.283	901.129	.145	1.642	.102
	MONTH	-316.702	238.723	-.121	-1.327	.186
	MECH	1369.625	2431.389	.041	.563	.574
	ANTECH	-1207.981	1658.872	-.065	-.728	.467
	ANIMAL	-1452.870	1892.565	-.059	-.768	.444
	EDUC	4002.003	2046.685	.145	1.955	.052
	AGSCI	-1054.955	2482.856	-.030	-.425	.671
	GPA	829.076	1186.459	.046	.699	.486
	GEND	4357.903	1194.630	.293	3.648	.000
	EMPLOY	128.353	183.167	.046	.701	.484
	AGBUS	2919.087	1406.614	.188	2.075	.039
5	(Constant)	14195.265	4072.425		3.486	.001
	NUMINTER	1509.240	896.364	.148	1.684	.094
	MONTH	-317.066	238.189	-.121	-1.331	.185
	MECH	1592.479	2368.852	.048	.672	.502
	ANTECH	-1041.061	1608.092	-.056	-.647	.518
	ANIMAL	-1250.939	1827.839	-.050	-.684	.495
	EDUC	4203.207	1986.712	.152	2.116	.036
	GPA	804.648	1182.423	.045	.681	.497
	GEND	4312.171	1187.119	.289	3.632	.000
	EMPLOY	134.103	182.259	.048	.736	.463
	AGBUS	3136.012	1307.771	.202	2.398	.017

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
6	(Constant)	13547.047	3941.212		3.437	.001
	NUMINTER	1500.385	894.851	.147	1.677	.095
	MONTH	-346.305	233.500	-.132	-1.483	.140
	MECH	1850.620	2331.382	.056	.794	.428
	ANIMAL	-910.715	1747.910	-.037	-.521	.603
	EDUC	4551.453	1909.497	.165	2.384	.018
	GPA	868.971	1176.390	.048	.739	.461
	GEND	4605.699	1095.399	.309	4.205	.000
	EMPLOY	128.397	181.760	.046	.706	.481
	AGBUS	3415.135	1232.715	.220	2.770	.006
7	(Constant)	13268.497	3897.130		3.405	.001
	NUMINTER	1524.372	891.914	.149	1.709	.089
	MONTH	-341.329	232.847	-.130	-1.466	.144
	MECH	2085.798	2282.787	.063	.914	.362
	EDUC	4752.311	1866.512	.172	2.546	.012
	GPA	923.880	1169.363	.051	.790	.430
	GEND	4476.138	1064.710	.300	4.204	.000
	EMPLOY	119.679	180.634	.043	.663	.508
	AGBUS	3635.776	1155.426	.234	3.147	.002
8	(Constant)	13924.633	3763.545		3.700	.000
	NUMINTER	1570.966	887.802	.154	1.770	.078
	MONTH	-357.865	231.159	-.137	-1.548	.123
	MECH	2040.359	2278.331	.061	.896	.372
	EDUC	4672.963	1859.870	.169	2.513	.013
	GPA	891.728	1166.602	.049	.764	.446
	GEND	4461.530	1062.884	.299	4.198	.000
	AGBUS	3534.813	1143.614	.227	3.091	.002
9	(Constant)	16715.339	912.723		18.314	.000
	NUMINTER	1615.715	884.890	.158	1.826	.069
	MONTH	-360.273	230.881	-.137	-1.560	.120
	MECH	2180.136	2268.469	.065	.961	.338
	EDUC	4662.431	1857.762	.169	2.510	.013
	GEND	4382.290	1056.646	.294	4.147	.000
	AGBUS	3592.221	1139.883	.231	3.151	.002

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
10	(Constant)	16773.804	910.510		18.422	.000
	NUMINTER	1605.474	884.647	.157	1.815	.071
	MONTH	-355.595	230.783	-.136	-1.541	.125
	EDUC	4386.612	1835.089	.159	2.390	.018
	GEND	4673.429	1012.086	.314	4.618	.000
	AGBUS	3303.793	1099.443	.213	3.005	.003
11	(Constant)	16481.649	893.762		18.441	.000
	NUMINTER	696.020	661.330	.068	1.052	.294
	EDUC	4512.046	1839.900	.163	2.452	.015
	GEND	4668.208	1015.733	.313	4.596	.000
	AGBUS	3627.388	1083.094	.233	3.349	.001
12	(Constant)	16975.299	761.008		22.306	.000
	EDUC	4676.734	1833.750	.169	2.550	.012
	GEND	4656.318	1015.957	.313	4.583	.000
	AGBUS	3522.753	1078.825	.227	3.265	.001

a. Dependent Variable: SALARY

Excluded Variables[i]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
2	VET	-.003[a]	-.012	.990	-.001	8.071E-02
3	VET	-.012[b]	-.145	.885	-.011	.584
	AGCROP	.014[b]	.151	.880	.011	.509
4	VET	-.015[c]	-.199	.842	-.015	.722
	AGCROP	.005[c]	.058	.954	.004	.664
	HORT	.012[c]	.156	.876	.012	.745
5	VET	-.005[d]	-.071	.943	-.005	.785
	AGCROP	.014[d]	.193	.848	.014	.742
	HORT	.019[d]	.261	.794	.019	.798
	AGSCI	-.030[d]	-.425	.671	-.031	.828
6	VET	.011[e]	.155	.877	.011	.889
	AGCROP	.029[e]	.411	.682	.030	.851
	HORT	.032[e]	.471	.638	.035	.909
	AGSCI	-.018[e]	-.260	.795	-.019	.877
	ANTECH	-.056[e]	-.647	.518	-.048	.551
7	VET	.017[f]	.256	.798	.019	.927
	AGCROP	.035[f]	.520	.604	.038	.898
	HORT	.037[f]	.555	.580	.041	.937
	AGSCI	-.011[f]	-.158	.875	-.012	.909
	ANTECH	-.039[f]	-.471	.638	-.035	.601
	ANIMAL	-.037[f]	-.521	.603	-.038	.830
8	VET	.019[g]	.290	.772	.021	.929
	AGCROP	.031[g]	.465	.642	.034	.904
	HORT	.037[g]	.552	.582	.040	.937
	AGSCI	-.015[g]	-.223	.824	-.016	.918
	ANTECH	-.038[g]	-.459	.647	-.034	.601
	ANIMAL	-.032[g]	-.459	.647	-.034	.837
	EMPLOY	.043[g]	.663	.508	.049	.967
9	VET	.023[h]	.349	.727	.026	.935
	AGCROP	.032[h]	.477	.634	.035	.904
	HORT	.038[h]	.574	.567	.042	.938
	AGSCI	-.010[h]	-.156	.876	-.011	.925
	ANTECH	-.041[h]	-.501	.617	-.037	.603
	ANIMAL	-.037[h]	-.528	.598	-.039	.844
	EMPLOY	.041[h]	.631	.529	.046	.969
	GPA	.049[h]	.764	.446	.056	.980

Excluded Variables[l]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
10	VET	.015[i]	.231	.817	.017	.949
	AGCROP	.021[i]	.317	.751	.023	.928
	HORT	.032[i]	.483	.629	.035	.946
	AGSCI	-.018[i]	-.278	.781	-.020	.941
	ANTECH	-.050[i]	-.608	.544	-.044	.611
	ANIMAL	-.049[i]	-.712	.477	-.052	.880
	EMPLOY	.039[i]	.599	.550	.044	.970
	GPA	.054[i]	.839	.402	.061	.987
	MECH	.065[i]	.961	.338	.070	.882
11	VET	.019[j]	.294	.769	.021	.950
	AGCROP	.025[j]	.374	.708	.027	.929
	HORT	.042[j]	.633	.527	.046	.955
	AGSCI	-.016[j]	-.236	.814	-.017	.941
	ANTECH	-.071[j]	-.886	.377	-.064	.634
	ANIMAL	-.043[j]	-.628	.531	-.046	.882
	EMPLOY	.049[j]	.758	.450	.055	.982
	GPA	.055[j]	.855	.394	.062	.987
	MECH	.063[j]	.925	.356	.067	.883
	MONTH	-.136[j]	-1.541	.125	-.111	.527
12	VET	.016[k]	.248	.805	.018	.952
	AGCROP	.027[k]	.411	.681	.030	.930
	HORT	.040[k]	.609	.544	.044	.956
	AGSCI	-.023[k]	-.355	.723	-.026	.954
	ANTECH	-.052[k]	-.653	.514	-.047	.661
	ANIMAL	-.050[k]	-.739	.461	-.054	.893
	EMPLOY	.050[k]	.764	.446	.055	.982
	GPA	.060[k]	.932	.352	.067	.993
	MECH	.063[k]	.927	.355	.067	.883
	MONTH	-.029[k]	-.440	.660	-.032	.949
	NUMINTER	.068[k]	1.052	.294	.076	.978

a. Predictors in the Model: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, HORT, AGSCI, AGCROP, EDUC, GEND, ANIMAL, MONTH, ANTECH

b. Predictors in the Model: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, HORT, AGSCI, EDUC, GEND, ANIMAL, MONTH, ANTECH

c. Predictors in the Model: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, AGSCI, EDUC, GEND, ANIMAL, MONTH, ANTECH

d. Predictors in the Model: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, EDUC, GEND, ANIMAL, MONTH, ANTECH

e. Predictors in the Model: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, EDUC, GEND, ANIMAL, MONTH

f. Predictors in the Model: (Constant), AGBUS, GPA, EMPLOY, NUMINTER, MECH, EDUC, GEND, MONTH

Excluded Variables[l]

g. Predictors in the Model: (Constant), AGBUS, GPA, NUMINTER, MECH, EDUC, GEND, MONTH

h. Predictors in the Model: (Constant), AGBUS, NUMINTER, MECH, EDUC, GEND, MONTH

i. Predictors in the Model: (Constant), AGBUS, NUMINTER, EDUC, GEND, MONTH

j. Predictors in the Model: (Constant), AGBUS, NUMINTER, EDUC, GEND

k. Predictors in the Model: (Constant), AGBUS, EDUC, GEND

l. Dependent Variable: SALARY

Exhibit A

Least Squares Multiple Regression Equation

Y = $14,071.16 (C) + $1,468.74 (X1) + - $314.91 (X2) + Academic Major + $837.28 (X4) + $4362.88 (Male) (X5) + $130.42 (X6)

Equation Variables
X1 = Number of Internships
X2 = Number of Months in First Internship
X3 = Academic Major
X4 = Grade Point Average
X5 = Gender (If Male)
X6 = Number of Years Employed
C = Constant
Y = Dependent Variable of Starting Salary

Agricultural Business $3,150.45
Pre-Veterinary Medicine (- $85.38)
Agronomy/Crop Science $312.53
Agricultural Mechanization $1,597.71
Horticulture $493.82
Animal Health Technology (- $974.83)
Animal Science (- $1,224.21)
Agricultural Education $4,235.19
Agricultural Science (- $825.37)

Exhibit B

Backwards Stepwise Multiple Regression Equation

$$Y = \$13{,}924.63(C) + \$1{,}570.97(X_1) + \$3{,}534.81(X_2) + \$4{,}672.96(X_3) + \$4{,}461.53(X_4)$$

Whereas: X_1 = Number of Internships

X_2 = Agricultural Business

X_3 = Agricultural Education

X_4 = Male Gender

C = Constant

Y = Dependent Variable of Starting Base Salary

VITA

Joseph A. Morgan

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE RELATIONSHIP OF UNDERGRADUATE INTERNSHIPS AND OTHER VARIABLES ON THE STARTING BASE SALARY OF AGRICULTURE GRADUATES AT MURRAY STATE UNIVERSITY 1992-1997

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