

Critical Factors Affecting Job Offers for New MIS Graduates

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ABSTRACT

Due to the sharp IT budget cuts in corporate America, the slowing economy, and the offshore outsourcing trend, job opportunities for MIS graduates have become scarcer in recent years. In addition to having good academic performance, MIS students have adopted aggressive approaches, such as MIS internships, double majors, and more technical course work, to securing employment. However, research on the critical factors affecting MIS full-time job offers has not received enough attention, and little empirical research is currently available. This study intends to explore this important issue using a survey research methodology. 742 seniors majoring in MIS were surveyed in three different US universities and 213 seniors actually participated in the survey. The critical factors identified in this study include internship experience, the nature of internship experience, double majors, the time when students declare their MIS majors, grade point average, and gender difference. The research findings in this study indicate that student GPA, networking-oriented internship, and double majors are identified as the key items influencing MIS full time job offers.

Keywords: MIS, full-time job offers, internship, double majors, gender, Grade Point Average, nature of MIS internship.

1. INTRODUCTION AND LITERATURE REVIEW

A recent survey by the National Association of College and Employers found that 42.4 percent of employers indicated that they expect to cut college hiring (Lee,

2003). According to the Bureau of Labor Statistics, the number of unemployed workers between the age of 20 and 24 is 1.4 million, up to 60 percent from four years ago. Today's graduating seniors are no longer under any delusion. A survey by job-search website Monster.com

found that 61 percent of college graduating seniors expected to move in with their parents (Chen, 2003). Since the end of the dot-com boom, unemployment among IT professional has soared, reaching a high of 6.5 in March 2003 (Chabrow, 2003). Most observers believe that outsourcing, immigration, and continued pressure to lower costs denote that white-collar workers will continue to struggle to find new employers. And these factors generally hit the software field harder than other technical fields (Costlow, 2003). MIS students are facing greater challenges in terms of finding MIS full-time job offers.

Many attempts are made by students and faculty in institutions of higher education to improve job placement of graduates. Internship experience and multiple majors have emerged as important factors that may improve the job placement of MIS students. Internships offer a mutually beneficial experience for companies and students (Pianko, 1996). Academicians, practitioners, and students themselves have widely extolled the benefits of internships, defined as structured and career-relevant work experience obtained by students prior to graduation from an academic program (Taylor 1988). Literature (Knouse 1999; Schambach and Kephart 1997) suggests that college internships offer a variety of benefits to students, such as increasing opportunities for finding a job upon graduation, reinforcing the skills learned from courses, and gaining a better understanding of organizations and career focus.

One study (Gault, Redington, Schlager, 2000) reported that new employees with internship experience received greater entry-level compensation than non-interns, with starting salaries averaging \$2,240 (9.23%) higher than non-interns. The time for interns to obtain their first positions was significantly shorter than for non-interns. However, the analysis in the study did not reveal that, for undergraduate business alumni, major area of study nor GPA was correlated with time to obtain first job, starting salary, and current salary. There was also no correlation between the above-mentioned measures and gender. Tests for interactive effects involving GPA, major, gender, and other demographic factors also failed to produce any significant results. For graduates with equal years of experience, only internship participation resulted in a significant difference in the aforementioned rewards. Graduates with business majors were the participants in this study; graduates with MIS majors were not separated out.

Empirical support for the benefits of internships is not extensive, however. Although several studies have reported that internships yield high job satisfaction and favorable employment opportunities for participants, these studies have rarely controlled for potential confounds such as the nature of the internship and full-time job offers, and other important factors such as single versus double majors, timing of MIS major declaration, gender difference, and grade point average. Additionally, the evidence for the employment value of supplementary experience has been found only in

research with limited samples (Fuller, 1991), and with limited controls on factors such as ability (Sagen, Dallam, Laverty, 2000) and major. Further research is needed to examine how these factors affect job opportunities, especially in the field of MIS. The research results can provide some insightful guidelines to MIS academia for revising MIS curriculum and can help MIS graduates in the job markets, especially in the economic downturn period.

2. HYPOTHESIS DEVELOPMENT AND REGRESSION MODEL

This research project is designed to investigate the relationship between full-time MIS job opportunities and factors such as internships, double majors, grade point average, etc. Based on the literature review, the authors designed a survey instrument (Appendix 1) to investigate a series of hypotheses. The list of the hypotheses developed for the study follows.

To characterize MIS job offers, this study employs two variables: the number of MIS full-time job offers that a student receives and the salary level of the offer that a student decides to accept. One student may receive multiple job offers but may not accept any of the offers because he or she is not satisfied with the salary level. On the other hand, another student might receive only one offer but with a salary level that he or she finds acceptable. The number of MIS full-time job offers received and the salary level of the offer that a student decides to accept are the two major aspects considered in describing MIS full-time job offers, although they are not the only measures.

Because of the poor job market, MIS graduating seniors might be relatively less fastidious about the potential MIS full-time job offers they might receive, compared to those who graduated four or five years ago. Although many factors such as nature of a job, compensation package, company reputation, commuting time, or geographic location could possibly affect MIS students' decisions about MIS full-time job offers, these factors may not be as important as first obtaining a full-time MIS job. On the other hand, aforementioned factors properly need to be carefully considered in studying MIS students' job placement when the job market is good for job applicants, though it is not easy to quantify and control those factors practically.

Positive feelings of satisfaction with co-workers, supervisors, and the job overall (Hunt, 1996) may come into play in student job placement. However they are relatively less important, especially given the fact that students have not yet begun their jobs. Therefore they are not included in the current study.

2.1 Hypotheses Related to MIS internship and MIS Full Time Job Offers

As one study (Gault, Redington, Schlager, 2000) indicated, three terms are commonly used to delineate higher-education programs that involve learning through

employment in industry: cooperative extension, cooperative education, and internship. Cooperative extension programs denote state-sponsored agricultural work experiences; therefore, these programs are not included in this study. Cooperative education originated to enable students in professional programs to finance their education (Thiel and Harley, 1997). Normally, cooperative education programs (co-op) are heavily concentrated in engineering and manufacturing disciplines. Internships generally refer to part-time or full-time field experience and cover a wide variety of academic fields and organizational settings. According to the study by Gault et al. (Gault, Redington, Schlager, 2000) the distinction between co-op and internship is more a matter of degree than of kind. While co-op students tend to work full time, interns can work part time or full time. Compensation is normally required for co-op students, although it may be optional for some internship programs. Based on the subtle differences between co-op and internship programs, it is not surprising that universities sometimes use the terms interchangeably. Thus, while this study does not include co-op experience, the research results are relevant for the co-op experience as well.

Job placement directors, recent graduates, and students identified internships as the most influential aspect of college preparation for the job market (Scott, 1992). In this research, we focus on MIS internships instead of general internships across all disciplines. Most studies on internships have been limited to a broad range of fields or disciplines, such as engineering and nursing (Sagen, Dallam, Laverty, 2000), business college internships (Knouse, 1999), and internships in general (Taylor 1988; Peak 1999). However, internships from different disciplines may influence full-time job offers that a student receives in different ways. Some internship may be very technically oriented, such as an MIS internship, where, for example, interns carry out debugging routines and determine working solutions to complex problems (Fleming, 1999). Potential employers may require students to take an internship and to use their specific software or hardware, not available in a university, in order to assess a student's technical background and expertise. Other internships may be much less technical, such as a liberal arts internship, and more people-oriented. Students' capability in these areas might be based on their performances in student organizations and possibly on their written work. The diverse nature of internships can exert different influences on full-time job offers. Thus, combining internships from multiple disciplines in one study might not be appropriate. On the other hand, not much has been reported about MIS internship's impact on MIS full time job placement. Based on the above discussion, this study hypothesizes the following:

H 1: Students who had an MIS internship receive the same opportunities for MIS full-time job offers as students who had no MIS internship. More specifically, H1 can be broken down into the following two sub hypotheses H1a and H1b.

H1a: Students who had an MIS internship receive the same number of MIS full-time job offers as students who had no MIS internship.

H1b: Students who had an MIS internship receive the same level of starting salary for the job offers that they accept as students who had no MIS internship.

2.2. Hypotheses Related to Double Major (Including MIS) and MIS Full Time Job Offers

Rumberger (1981) estimated that approximately 40% of all U.S. college graduates in 1976 had more education than their jobs required. For employers, a higher level of education has been correlated with positive work-related attitudes and behaviors, such as the increased importance of challenges and other higher-order needs in one's work (Quinn and Mandilovitch, 1977), the desire for intrinsic job rewards (Witney, 1972), tolerance of change (Mandilovitch, 1977), and the capacity to benefit from on-the-job training and experience (Bowen, 1977).

MIS students sometimes have double majors. There can be various reasons for these students to have double majors: some would like to increase their marketability, especially by choosing a major that currently has good job placement; others are very interested in both major disciplines. Students may not want to drop their first major when they choose a second major, because they find the first major very interesting and/or marketable, and they have already invested so much effort in finishing course requirements for the first major. With the large amount of extra course work needed for double majors, it is important to consider the influence of double majors on MIS full-time job offers. However, few studies have been found in terms of addressing double major's influence on students' MIS full time job offers.

In light of the above delineation, this study sketches out the following hypotheses:

H 2: Students with MIS as a single major have the same opportunities for MIS full-time job offers as students with double majors including MIS. More specifically, H2 can be broken down into the following two sub hypotheses H2a and H2b.

H2a: Students with an MIS single major receive the same number of MIS full-time job offers as students with double majors including MIS.

H2b: Students with an MIS single major receive the same level of salary for the job offers that they accept as students with double majors including MIS.

2.3 Hypotheses Related to MIS Major Declaration Time and MIS Full Time Job Offers

During their college years, students declare their majors at different time periods. Some students declare an MIS major relatively early, such as in their sophomore year while others declare majors later, in their junior or even senior years. The time when students declare MIS majors could be a factor influencing students' full-time job

offers. Compared to students who declare MIS majors later, students who declare their MIS majors early may show somewhat more explicit and clear professional goals and objectives. They therefore may tend to focus more on courses and activities directly related to the MIS discipline. On the other hand, the students with late MIS major declarations could spend more time in diverse courses and activities that may not directly relate to their MIS discipline. As a result, their knowledge outside MIS area could be richer and more extensive. How does MIS major declaration time affect MIS full-time job offers? There is little information on this factor in the existing literature.

According to the above description, this study proposes the following hypotheses:

H 3: Students who declare their MIS majors earlier have the same opportunities for MIS full-time job offers as students who declare their MIS majors later.

More specifically, H3 can be broken down into the following two sub hypotheses H3a and H3b:

H3a: Students who declare their MIS majors earlier receive the same number of MIS full-time job offers as the students who declare their MIS majors later.

H3b: Students who declare their MIS major earlier receive the same level of salaries for the job offers they accept as the students who declare their MIS majors later.

2.4 Hypotheses Related to Gender Influence and MIS Full Time Job Offers

The narrowing definition of information technology tends to exclude and devalue the contribution of women (Cukier, Shortt, Devine, 2002). Sex-role stereotypes influence employment decisions (Arvey and Campion, 1982). Research on sex discrimination shows that most jobs have gender stereotypes that interact with the gender of incumbents or job applicants to influence personal decisions about which candidate receives a job offer. Other factors being equal, women tend to obtain lower evaluations than men in job performance and hiring situations. In spite of gains in employment opportunities and status, there are still more women than men in low-pay and low status jobs (Athey and Hautaluoma, 1994). The results of this study suggest that employers treat male and female job applications differently, and that employers tend to hire female applicants for low-status jobs. This finding is consistent with Burris (1983), that over-education is more prevalent among women than among men. In the Wessels and Pumphrey study (1996), the impact of co-op (or internship) experience on job-search time and quality of job placement is examined. In some cases, there was a gender difference favoring males.

The explanation for this is unclear, except that success might be linked to a predominantly male profession such as computer science. There is no clear and consistent

description in the literature (Pedro 1984; Shaffer 1980; Vecchiotti 1980), regarding gender influence on job offers. When studying MIS internships' impact on MIS full-time job offers, we take the gender issue into consideration because gender might affect students' MIS full-time job offers.

The unclear and inconsistent description about gender influence on job offers in the literature suggests the following hypotheses:

H 4: Female MIS students have the same opportunities for MIS full-time job offers as male MIS students. Specifically, H4 can be broken down into the following two sub-hypotheses, H4a and H4b:

H4a: Female MIS students receive the same number of MIS full-time job offers as male MIS students.

H4b: Female MIS students receive the same level of salaries for the job offers that they accept as male MIS students.

2.5 Hypotheses Related to MIS Internship Nature and MIS Full Time Job Offers

Among the ten fastest-growing occupations, positions for network systems and data communications analysts are the ones associated with MIS. Bureau of Labor Statistics (BLS) expects the aforementioned positions to jump by 57 percent (106,000 new job) between 2002 and 2012 (Sahadi, 2004). To increase the chance to be employed in MIS area, MIS students may need to take internships with the nature related to the MIS positions that are in great demand in the near future.

Academic skills can be defined as thinking and reasoning skills that have been found to be important across a range of disciplines (Floyd and Gordon 1998), with the degree of importance varying by industry. Academic skills were identified to be of paramount importance for entry-level hires in technical fields such as the computer industry. Academic skills incorporate analytical skills, using computer applications, creative thinking, information search, and problem solving. The various natures of MIS internships might influence students' academic skills, especially computer skills and problem-solving skills, in different ways.

The education that students obtain from their internships can vary significantly, depending on the nature of the internship. Some internships may emphasize programming while others could demand problem-solving skills. Students can build a broad range of work experience from their internships. Job-related experiences could be database development and maintenance, system analysis and design, website development, etc. The different natures of MIS internships may impinge on students' full-time job offers in a different manner. From the literature, we could not find any substantial research on how the nature of the MIS internship affects MIS full-time job opportunities. No MIS internship has been pinpointed as the most

favorable internship that facilitates students to apply for MIS full time jobs. Thus, this study puts forward the following hypotheses:

H 5: MIS students who have had MIS internships have the same opportunities for MIS full-time job offers regardless of the nature of their MIS internships. Specifically, H5 can be broken down into the following two sub-hypotheses H5a and H5b:

H5a: MIS students who have had MIS internships receive the same number of MIS full-time job offers regardless of the nature of their MIS internships.

H5b: MIS students who have had MIS internships receive the same level of salary for the job offers that they accept regardless of the nature of their MIS internships.

2.6 Hypotheses Related to GPA and MIS Full Time Job Offers

Because students with higher GPAs are more likely to complete occupational and professional training (Astin, 1977) than are students with low GPAs, GPA can be used as an indicator of career development. It can be used to clarify the place of other variables in the career development sequence.

Grade point average has been used as one of the important indicators for students' academic performance. Recruiters sometimes explicitly specify the requirements for a job applicant's GPA, and recruiters almost always require applicants to report their GPAs either directly or indirectly. It seems that recruiters believe that students' GPAs offer evidence regarding how well students are prepared for their careers, other things being equal.

In one study (Albrecht, Carpenter, Sivo, 1994), 80.5 percent of all recruiters representing 664 employers reported a preferred minimum grade point ratio. In particular, business recruiters held true to their emphasis on grades; 77.2 percent reported a preference for at least 3.0. The results of the study indicate that employers value both high grades and high involvement, such as participation in student organization and pre-professional activities, although the value placed on grades is somewhat higher. However, MIS or IT recruiters' opinions were not separated out in the study.

In another study (Rosson, Schoemer, Nash, 1973), the results based on the 478 responses indicate no significant differences between the GPAs of employed and unemployed graduates. In other words, based on the evidence of this study the assumption that students with high grades have a better chance of obtaining employment is not valid. Their study (Rosson, Schoemer, Nash, 1973) included responses from various fields of study, not only MIS. The inconclusive findings from the aforementioned studies suggest the following hypotheses:

H 6: MIS students receive the same opportunities for MIS full-time job offers regardless of their grade point average. In particular, H6 can be broken down into the following two sub hypotheses H6a and H6b:

H6a: MIS students receive the same number of MIS full-time job offers regardless of their grade point average.

H6b: MIS students receive the same level of salary for the job offers that they accept regardless of their grade point average.

2.7 Regression Analysis

In addition to hypothesis testing, multiple linear regression analysis is another part of this study. In the multiple linear regression models, dependent variables include the number of full-time MIS job offers and the salary levels of the MIS full-time job offers that students accept. Independent variables include gender, number of majors, number of MIS internships, time of MIS major declaration (during the first two years versus after the second year), the nature of MIS internships, and GPA. The nature of MIS internship is categorized by six dummy variables, based on the corresponding optional answers in Question 12 (See Appendix 1). The value of each dummy variable can only be zero or one. Value 1 means that the corresponding internship is taken, while value 0 refers to the fact that the internship is not taken. Students' GPA is also categorical, and thus further described by three dummy variables matching each possible GPA category offered in question 23 in the survey.

The multiple linear regression analysis may offer more information about the relationships between the dependent variable and the independent variables collectively. Some independent variables may be very nearly obtainable as a linear combination of the remaining independent variables. Multicollinearity may exist among the independent variables. Even if all the null hypotheses developed in this study are rejected, some of the independent variables may still not be included in the multiple linear regression models because of multicollinearity. The maximum R² improvement procedure was used to identify the independent variables included in the regression. This procedure has advantages over other stepwise selection procedures and is almost as effective as examining all possible regressions (Bowerman and O'Connell, 1986).

3. METHODOLOGY

In 2001, six MIS students participated in the pilot test. Based on the feedback from the pilot test, the authors, with the assistance of three statisticians, refined the questionnaire. The questionnaires were then sent to 220 senior students who were taking a 400-level course required for the MIS major in the fall of 2001. 161 (73 percent of the potential subjects) students participated in the survey. Feedback was collected again. Then the authors consulted two statisticians and further refined the questionnaire at the end of 2001.

Seniors from three AACSB-accredited business schools were participants in this empirical study during the spring of 2002. Two schools are from the Mid-west region (Cincinnati area and Athens, Ohio), while the other school is located in a metropolitan area in the south (Memphis, Tennessee). 742 seniors were informed about the survey in these three schools (120, 250, and 372 respectively). 213 seniors participated in the survey.

The primary focus of the MIS programs in these three schools is on the undergraduate program. The undergraduate MIS program's curriculum and requirement in each of these three schools are fairly similar. Each of the three schools has received AACSB accreditation many years ago. The majority of the MIS students in these three schools started their job search in the fall of year 2001. Up to the end of the survey (May, 2002), students' job search duration was about ten months. Each MIS program actively encourages students to take MIS internships although internships are not required in those three schools. The majority of the internships are paid-internships and students do not receive course credits for their internships.

Demographic background, the nature of MIS internships, and information about full time job offers were solicited in the questionnaire. Students' participation in 2002 was optional and anonymous. 213 students participated in the survey. Demographically, 52 percent of the subjects are male and 48 percent are female. 64 percent had single major (MIS); 34 percent had double majors; 2 percent had three majors. Among those with double or triple majors, the percentages corresponding to non-MIS majors were as follows: marketing (37%), finance (35%), accounting (16%), decision science (10%), and management (2%). 48 percent of the participants declared their MIS major in the first two years of college, while 50 percent of them did so during the last two years of college (2 percent of the subjects did not respond). 35 percent reported that they did not have an MIS internship experience, while 41 percent of the participants had one MIS internship. 20 percent of the participants had more than one MIS internship experience. Four percent of the subjects did not respond to the question about internship experience. The aforementioned statistics, such as MIS internship percentages, may not be generalizable to other schools. The main reason is that the three universities in this study are not randomly selected.

4. DATA ANALYSIS

The statistical data analysis was conducted by using the SAS System Windows V 8 and MS Excel 2000. The results are shown below.

4.1 Results for Hypothesis 1

Hypothesis 1 asserts that students who had an MIS internship receive the same number of MIS full-time job offers as students who had no MIS internship, and students who had an MIS internship receive the same

levels of starting salary for the job offers that they accept as students who had no MIS internship.

The GLM procedure performed shows that none of the results for the sub-hypotheses was significant. This could be due to the change of MIS recruiters' perspective on the entry-level employee requirements. With the recent economic downturn, many companies cut their training budgets for new hires, and prefer to hire employees with prior work experience, such as those who were laid off but had real world work experience. More studies are needed to investigate MIS recruiters' changes in perspectives on and expectations for new hires.

4.2 Results for Hypothesis 2

Hypothesis 2 states that students with an MIS single major receive the same number of MIS full-time job offers as the students with MIS double majors including MIS; students with an MIS single major receive the same level of salary for the job offers that they accept as the students with double majors including MIS. The GLM procedure performed on this hypothesis shows the following results (See Appendix 2). The double major degree does have a significant effect on students' starting salaries, although it does not significantly influence the number of job offers. For students with double majors including MIS, the average starting salary offer is between 45,000 and 49,999, whereas students with single MIS majors have average starting salaries of 40,000 to 44,999. Students with more than two majors all reported starting salaries of more than 50,000. The interpretation is that having another major, in addition to MIS major, might result in students' higher starting salaries. A plausible reason could be that a double major enables students to garner more knowledge about business processes and more thorough understanding of business problems. Having double majors may offer both employers and employees more flexibility in filling full-time positions.

4.3 Results for Hypothesis 3

Hypothesis 3 states that students who declare MIS majors earlier receive the same number of MIS full-time job offers as students who declare MIS major later; students who declare MIS majors earlier receive the same level of salary for the job offers that they accept as the students who declare MIS majors later. The GLM procedure performed shows insignificant results (See Appendix 2). The study failed to reject the null hypothesis.

4.4 Results for Hypothesis 4

Hypothesis 4 states that female MIS students receive the same number of MIS full-time job offers as male MIS students, and female MIS students receive the same level of salary for the job offers that they accept as male MIS students.

The GLM procedure performed demonstrates that the results (See Appendix 2) are not statistically significant. The null hypothesis is not rejected.

4.5 Results for Hypothesis 5

Hypothesis 5 states that MIS students who have had MIS internships receive the same number of MIS full-time job offers regardless of the nature of their MIS internship, and MIS students who have had MIS internships receive the same levels of salary for the job offers that they accept regardless of the nature of their MIS internship.

Six dummy variables (with zero or one as a possible answer) were created based on the seven categories of the MIS internship nature listed in Question 12 in the survey. For example, q12a refers to a variable that has a value of one if the internship is related to system analysis and design; otherwise its value is zero. Thus, under Hypothesis 5, there are 12 sub-hypotheses (See Appendix 3).

For example, sub-hypothesis 1 is that students who had MIS internships receive the same number of MIS full-time job offers regardless whether or not the nature of the internship is related to system analysis and design.

For each of the above twelve sub-hypotheses, none of the corresponding GLM procedure performed shows a significant result (See Appendix 3).

4.6 Results for Hypothesis 6

Hypothesis 6 states that MIS students receive the same number of MIS full-time job offers regardless of the level of the students' grade point average, and MIS students receive the same level of salary for the job offers that they accept regardless of the level of the students' grade point average.

Three dummy variables (with zero or one as a possible answer) were created based on the four categories of the GPA range described by Question 23 in the survey. For example, q23a refers to a variable that has a value of one if the GPA is equal to or higher than 3.5; otherwise its value is zero. Thus, under hypothesis 6, there are six sub-hypotheses.

For instance, sub-hypothesis 1 is that MIS-major students receive the same number of MIS full-time job offers regardless whether their GPA is equal to or higher than 3.5.

The GLM procedure performed shows that results (See Appendix 4) are significant for sub-hypotheses 1 and 5, but not for the rest of the sub-hypotheses. For students with GPA higher or equal to 3.5, 67.3 percent received MIS full-time job offers, while 45.2 percent of the students with GPA between 2.5 and 3.0 received MIS full-time job offers. The statistical analysis shows that students with high GPA (higher or equal to 3.5) have a significantly higher chance of obtaining the full-time MIS job offers, compared to students with low GPA (between 2.5 and 3.0). The interpretation for this result can be that high GPA (higher or equal to 3.5) may indicate that the students have better qualifications and preparation for their careers in the MIS field. High GPA might also signify students' strong dedication,

commitment, and consistency in preparing for their future vocation. MIS recruiters may use GPA as one of the important criteria to make recruiting decisions.

4.7 Results for Regression Analysis

The maximum R^2 improvement procedure performed shows that networking-related MIS internships and high GPA (equal to or higher than 3.5) are the two dummy variables selected in the regression model for the dependent variable – the number of MIS full-time job offers received (See Appendix 5 and 6). Interestingly, the variable (number of MIS internships) is not selected in the regression model. The values of Variance Inflation Factor (VIF) are small for both selected independent variables (See Appendix 5). It appears that multicollinearity is not a big issue.

For the other dependent variable—the salary level of the offers that students accept, the number of majors that a student has and the number of internship experiences are included in the regression model (See Appendix 7 and 8). Interestingly, the number of majors that a student has significantly affects his or her starting salary. In other words, double-major students have significantly higher starting salary than do single-major students. Although internship experience is selected in the regression model, the effect is not statistically significant. The values of VIF for both selected independent variables show that multicollinearity is not a big issue (See Appendix 7).

It is possible that the potential differences in student groups (e.g. demographic differences), may cause the differences of student MIS full-time job offers. This study examined the effect of student group difference on the number of MIS full-time job offers and the salary level for the job offers accepted. The statistic results (See Appendix 9) show that student group effect on MIS full-time job offers is not statistically significant.

5. CONCLUSION AND FUTURE STUDY

This study has shown the relationships between MIS full-time job offers and other variables, such as an MIS internship, gender, MIS major declaration time, the nature of the MIS internship, double majors, and grade point average. In view of the analysis results, IS educators should suggest that students pursue double majors including MIS, if they wish to receive higher salary for their MIS full-time job offers. Moreover, students need to have high GPA (higher or equal to 3.5) and/or pursue networking-oriented MIS internship in order to receive more MIS full-time job offers. IS educators should advise students to take networking related courses to facilitate students' networking-oriented internship. These courses include computer network administration and networking security etc. For those MIS programs that do not have the aforementioned courses, their curriculums may need to be improved accordingly. Having a computer networking lab would be a plus to the MIS curriculum development.

This study is the first that empirically investigates the impact of multiple factors, such as GPA and internships, on full-time MIS job offers. The participants in the study only include the students who have MIS majors, instead of business students or college students in general. The students participated in the study are from relatively comparable universities (e.g. they are all public schools that have received AACSB accreditation). The number of MIS full-time job offers received and the salary levels of the offer that students accept are the two main aspects describing the MIS full-time job offers. The findings of this study can aid MIS students' career development, and help MIS faculties to improve advising and curriculum design.

Although GPA, networking-oriented internships, and double majors are identified as the key items influencing MIS students' job offers, the adjusted R-Square in the regression models are relatively low. This indicates that there might be other factors affecting MIS students' job offers, such as the applicant's initiative and the way he or she contacts the prospective employer (phone call, mail-in resume, walk-in interview, referral by a friend, employment agency). Because of very few similar prior studies existing in the research literature, the current study, as an initial effort to examine this important research issue, only explores some critical factors, not all factors, in influencing MIS full-time job offers. As a result, future studies should extend the current research to study additional factors. For example, skills in interviewing, communication on a one-to-one basis, quality of written resumes, or knowing when and where to apply for a job could be the potential factors influencing students' MIS full-time job offers. These items may need to be examined in future research. The survey instrument (Appendix 1) can be further modified to incorporate those items. In addition, recruiters' opinions about MIS students' job offers and hiring criteria should be considered. Difference in opinions between students and recruiters about MIS job offers and hiring criteria may offer insights for students' career development and curriculum improvement in MIS undergraduate programs.

The kind of non-MIS major in the double major might need to be examined because some non-MIS majors may have better synergy with MIS than others. Whether MIS graduates received full-time MIS job offers and the salary level they received could subject to the geographical difference such as north versus south, metropolitan areas versus non-metropolitan areas. Therefore, comparative study between schools in metropolitan areas and schools in non-metropolitan areas is recommended for future study.

The hypothesis testing in this study shows quite a few insignificant results about the dependent variables examined. However, some prior studies reported significant differences. One possible and plausible explanation could be that prior studies were not specifically conducted during economic downturns whereas the current study was. As a result, some factors

such as internship experience were statistically significant in influencing a full job offer for college graduates in prior studies, but not in the current study. During the economic downturn period, even many experienced workers are laid off and are looking for jobs. Therefore, MIS graduates with internship experience or double major, and those without internship experience are actually competing with the unemployed people possessing experience in job markets. Hence, potential employers might hire those experienced applicants first. As labor market is normally very tight during economic downturns, not many jobs are available in job markets. It may not matter significantly whether MIS graduates have internship experience or not.

Out of 742 seniors in three schools, only did 213 students participate in the survey. Incentive could have been offered (e.g. extra credit) to encourage students' participation and increase response rate. Relatively low response rate and small sample size (three schools only) could contribute to the insignificant testing results.

Another implication of the current research findings is that the research findings reported from economic development period might not be directly applicable to the economic downturn period. Future studies may include a longitudinal study methodology to further investigate MIS job markets in both economic downturn and development period. The relationships between MIS full-time job offers and the critical factors examined in the current study may vary along with dissimilar economic conditions. MIS faculty and graduates might need to adopt different strategies to improve students' MIS full-time job offers across various economic conditions (e.g. economic slump versus economic development).

The insinuation to MIS seniors during economic downturns is that increasing the total number of internship experiences only might not result in statistically significant better chances in landing a full-time MIS job offer. One of the reasons could be that MIS seniors are competing with those laid-off IS professionals who are more experienced. They may have to think of other ways to compete with those experienced workers. One possible strategy could be that they may take some courses specifically covering new technologies and/or methodologies, so that those laid-off workers don't know much about the new technologies or methodologies. In this way, the rich experience of those laid off workers may not be an advantage over new MIS graduates. One of such new IS development methodologies could be Object-oriented methodology using Unified Modeling Language (UML). Some big MIS recruiters such as E & Y, IBM, and EDS came to the universities where the authors work, and indicated that many new IS projects would require UML knowledge and skill but not many experienced IT professionals had formal training and good experience in using it. Consequently, those students who take this

course could have some advantage over their competitors in the job market even during economic downturns.

Like other MIS studies, this study is not without its limitation. Some important factors are examined in this study. Prior work experience-other than internship and co-op may have an impact on MIS full-time job placement too. Some students are already working in MIS field and are pursuing a credential for future advancement. Other factors that could influence MIS job placement may include students' service and leadership activities while students are in college.

Additionally, there might be biases inherent in self-report, particularly as it relates to data such as salary and GPA. For the future study, actual GPA and self-reported salary may need to be connected. It would also be interesting to extend this research by surveying the employers of the new MIS graduates.

We would like to increase the subject sample size so that we can conduct a more detailed analysis among the independent variables and on the variables that have multiple levels, such as MIS internship nature. To further improve this study, the authors can collect data in more universities (both within and outside the U.S.). The high concentration of the respondents with primary operations in the Midwest and the South may limit the generalizability of the findings. Although the authors believe hiring criteria for MIS graduates are somewhat similar in major cities across the U.S., the findings might not be directly generalizable to every market. For example, for students at nationally recognized (elite) schools, internships may be less of an advantage than for students enrolled in less prestigious institutions—in other words, recognition of the name school may outweigh the benefits of the internship. MIS full-time job offers might also vary with the prestige of the internship employer, and future research investigating prestige as a mediating variable may prove fruitful.

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APPENDIX 1
Survey Instrument

The objective of this survey is to investigate the factors that have impact on students' full-time job offers in the field of Management Information Systems (MIS). Please fill your answer on the scanner form provided. Please leave identity section, such as name, birth date, id number, special codes of the scanner form, blank. Your personal information will be kept confidential. The result of this survey will be shared later. Thank you for your cooperation.

1. What is your primary major?
 - a. MIS
 - b. Majors other than MIS in the business school
 - c. Non-Business major
2. What is your gender?
 - a. Male
 - b. Female
3. How many majors are you currently working for?
 - a. 1
 - b. 2
 - c. 3
 - d. 4 or more

You can skip this question (No. 4) if you major in MIS only (MIS Single major).

4. If you major in another major other than MIS, select another major:
 - a. Accounting
 - b. Marketing
 - c. Finance
 - d. Decision Science/Management Science
 - e. Economics
 - f. Organization Behavior
 - g. Management (Production/Operation/Human Resource)
 - h. None business
5. When did you declare your major in MIS?
 - a. Freshman or Sophomore year
 - b. Junior or Senior year
6. When is your expected graduation time?
 - a. Spring 2002
 - b. Summer 2002
 - c. Winter 2002
 - d. Spring 2003
 - e. Fall 2003
7. What is your opinion about the next year's job market in MIS area, compared to this year's market?
 - a. Much Worse
 - b. Worse
 - c. Same as this year
 - d. Better
 - e. Much better
8. What factor is the most important factor in finding a full-time MIS job? (Please select only one)
 - a. Communication skill
 - b. High GPA
 - c. Intern work experience
 - d. Management Skills
 - e. Recommendation from a teacher
 - f. Technical skills
 - g. Other (please specify: _____)
9. What factor is the most important factor in finding an MIS intern job?
 - a. Communication skill
 - b. High GPA
 - c. Intern work experience
 - d. Management Skills
 - e. Recommendation from a teacher
 - f. Technical skills
 - g. Other (please specify): _____

10. How many MIS related intern work experiences have you had before?
 - a. 0
 - b. 1
 - c. 2
 - d. 3
 - e. 4
11. From which source did you find an MIS related internship?
 - a. School's career planning office
 - b. Internship fair
 - c. Internet search
 - d. MIS department office
 - e. Relatives/Friends
 - f. Instructors' recommendation
 - g. Other media (please specify):
12. What is the nature of your most recent MIS related intern work?
 - a. Systems Analysis and Design
 - b. Clerical
 - c. Database related
 - d. IT help desk
 - e. Networking related
 - f. Programming
 - g. Non-MIS related work
 - h. Other (please specify):
13. From which type of firms/industry did you work for your MIS related internship?
 - a. IT Consulting firms (Big 4: Accenture, Cap Gemini, Deloitte Touche, and PWC)
 - b. IT Consulting firms (other than Big 4 firms)
 - c. Computer technology vendors (e.g., Microsoft, Oracle, Cisco, Dell, etc.)
 - d. Manufacturing firms (e.g., General Electric, Proctor & Gamble)
 - e. Retail firms (e.g., Groceries, department/discount stores, etc.)
 - f. Financial firms (e.g., banks, investment, insurance, etc.)
 - g. Health Care related firms
 - h. Delivery service related firms
 - i. Other (please specify):
14. How many full-time MIS jobs offers do you currently have?
 - a. 0
 - b. 1
 - c. 2
 - d. 3
 - e. 4
15. What is the nature of the full-time MIS job you are offered (if more than one job offer, please describe the one you will accept)?
 - a. Systems Analysts and Design
 - b. Database
 - c. Help desk
 - d. Programming
 - e. Networking
 - f. Web Design/Development
 - Other (please specify:)
16. To what extent, do you feel that your MIS related internship helps you do better job in MIS courses?
 - a. No help at all
 - b. A little help
 - c. Some help
 - d. A great amount of help
17. To what extent, do you feel that your MIS course work helps you do better job in MIS related internship?
 - a. No help at all
 - b. A little help
 - c. Some help
 - d. A great amount of help

18. If you have a full-time MIS job offer now, does the job offer come from a company where you had MIS related internship?
- Yes
 - No
19. If you have a full-time job offer now, is the job MIS- related?
- Yes
 - No
20. If you have a full-time MIS job offer now, then from what type of companies do you receive your job offer(s) ?
- IT Consulting firms (Big 4: Accenture, Cap Gemini, Deloitte Touche, and PWC)
 - IT Consulting firms (other than Big 4 consulting firms)
 - Computer technology vendors (e.g., Microsoft, Oracle, Cisco, Dell, etc.)
 - Manufacturing firms (e.g., General Electric, Proctor & Gamble, International Paper)
 - Retail firms (e.g., Groceries, department/discount stores, etc.)
 - Financial firms (e.g., banks, investment, insurance, etc.)
 - Health Care related firms
 - Delivery service related firms
 - Other (please specify: _____)
21. Please select the salary range for the full-time MIS job offer you take.
- Below 30,000
 - 30,000-34,999
 - \$35,000-39,999
 - \$40,000-44,999
 - \$45,000-49,999
 - \$50,000-\$54,999
 - Over \$55,000
 - Undecided yet; (Salary offered is above \$55,000, then specify: \$ _____)
22. How much did you receive for your MIS intern work per hour?
(Please approximate hourly wage if paid a lump sum)
- \$10 per hour or below
 - \$11-13 per hour
 - \$14-16 per hour
 - \$17-19 per hour
 - \$20-22 per hour
 - 23 dollars per hour or more
 - Others (please specify: _____)
23. What is your current GPA range?
- Equal to or higher than 3.5
 - Higher than 3.0 but lower than 3.5
 - Between 2.5 and 3.0 (including 2.5 and 3.0)
 - Lower than 2.5

END. Thank you very much for your participation!

Appendix 2
Testing Results for Hypothesis 1 through 4

Hypothesis	Independent Variable	Dependent Variable	F Value	P Value
H1 sub 1	Internship	Number of offers	2.50	0.116
H1 sub 2	Internship	Level of salary	0.88	0.353
H2 sub 1	Number of Majors	Number of offers	0.01	0.95
H2 sub 2	Number of Majors	Level of salary	4.65	0.04
H3sub 1	MIS major declaration time	Number of offers	0.57	0.45
H3 sub 2	MIS major declaration time	Level of salary	1.45	0.23
H4 sub 1	Gender	Number of offers	0.04	0.85
H4 sub 2	Gender	Level of salary	0.25	0.62

Appendix 3
Testing Results of the Sub-Hypotheses for Hypothesis 5

Hypothesis	Independent Variable	Dependent Variable	F	P
H5 sub 1	Internship related to systems analysis and design	Number of offers	0.65	0.42
H5 sub 2	Same as above	Level of salary	0.52	0.48
H5 sub 3	Clerical Internship	Number of offers	0.15	0.70
H5 sub 4	Same as above	Level of salary	0.68	0.41
H5 sub 5	Database related internship	Number of offers	0.07	0.79
H5 sub 6	Same as above	Level of salary	0.22	0.64
H5 sub 7	IT help desk related Internship	Number of offers	3.67	0.06
H5 sub 8	Same as above	Level of salary	0.04	0.85
H5 sub 9	Networking related internship	Number of offers	3.27	0.07
H5 sub 10	Same as above	Level of salary	0.01	0.99
H5 sub 11	Programming related internship	Number of offers	0.07	0.79
H5 sub 12	Same as above	Level of salary	2.56	0.12

Appendix 4
Testing Results of the Sub-Hypotheses for Hypothesis 6

Hypothesis	Independent Variable	Dependent Variable	F Value	P Value
H6 sub 1	GPA equal to or higher than 3.5	Number of offers	7.93	0.01*
H6 sub 2	Same as above	Level of salary	0.64	0.43
H6 sub 3	GPA higher than 3.0 but below 3.5	Number of offers	0.11	0.75
H6 sub 4	Same as above	Level of salary	0.01	0.91
H6 sub 5	GPA is between 2.5 and 3.0	Number of offers	5.76	0.02*
H6 sub 6	Same as above	Level of salary	0.74	0.39

**Appendix 5
Regression Model One and Parameter Statistics**

Dependent Variable	Independent Variable	Parameter Estimate	P Value	VIF Value
The number of MIS full-time job offers	Networking related internships	0.46	0.04	1.006
	GPA(equal to or higher than 3.5)	0.66	0.0004	1.006

**Appendix 6
Regression Model One and Model Statistics**

Dependent Variable	Model F Value	Model P Value	Adjusted R-Squared Value
The number of MIS full-time job offers	8.34	0.0004	0.13

**Appendix 7
Regression Model Two and Parameter Statistics**

Dependent Variable	Independent Variable	Parameter Estimate	P Value	VIF Value
The salary level for the offers accepted	Networking related internships	0.52	0.03	1.06
	GPA(equal to or higher than 3.5)	0.66	0.16	1.06

**Appendix 8
Regression Model Two and Model Statistics**

Dependent Variable	Model F Value	Model P Value	Adjusted R-Squared Value
The salary level for the offers accepted	3.40	0.04	0.07

**Appendix 9
MANOVA Analysis about Student Group Effect
on MIS Full-Time Job Offers**

Wilks' Lambda	F Value	P Value
0.99	0.18	0.94