What is the best way to raise the Average Salary of Graduating MBAs?

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Executive Summary

At the MBA career services office at the University of Washington, the main goal is to increase the average salaries of students placed into jobs. The higher the average salaries the office is able to help produce, the higher the ranking of UW's overall MBA program. The purpose of this paper is to find out what factors contribute most to higher salaries for MBAs. Factors included in the model were job function, job industry, location (inside Washington or outside Washington), years of experience, size of the hiring companies (in terms of number of employees), and whether or not the student majored in business as an undergraduate.

The data includes 405 observations from all the students graduating from 1998 to 2003. This data covers a broad spectrum of job markets, including the huge economic expansion of the late 90's to the recent recession of 2001 and 2002. All the data collected was compiled from exit surveys administered by the MBA program office.

After running a multiple linear regression, four factors showed statistical significance. Jobs within Washington State paid an average of roughly $3,800 less than jobs outside of the state. Experience was another statistically significant factor, with an approximate return of $1,700 per every additional year of experience. For example, a person with 5 years of experience would make an average of $1,700 more than a comparable person with 4 years of experience. Working in the government/non-profit industry has an average salary of $13,500 less than working in the corporate world. Finally, larger companies tended to pay higher salaries than smaller companies, but the exact amount is uncertain, because variance is very high.

The Question

The MBA career services office of UW is evaluated based upon the average salaries of the graduating class. Because of this, the office is continually trying to find strategies to increase salaries. The model includes several variables that have the potential to be important factors, and tests to see if they have a significant impact on the salaries using a multiple linear regression.

The variables chosen were the following: function served in the company, what industry the job is in, location (inside Washington or outside Washington), years of professional experience, size of the hiring companies (in terms of number of employees), and whether or not the student majored in business as an undergraduate.

Data

The data used was collected from surveys taken of the graduating classes of MBAs from 1998 through 2003. These years cover a vast array of job climates, because they include the hiring frenzy of the late 90s as well as the much more conservative hiring practices in 2001 and 2002. The data consists of 405 observations from these years. While there are roughly 125 MBA students per class at UW, not all of them find jobs at the time of graduation. In addition, some students fail to fully complete the surveys, which left many data points incomplete and therefore un-useable. 96 percent of the class of 2003 students had jobs by August of 2003, but the placement percentages for previous years were considerably worse. This paper does not include un-hired students because the question asks which factors increase the average salary of placed students, not whether or not students were able to find employment.

The Model

The purpose of the model was to discover which aspects of an MBA position contribute most to higher salaries. This meant making a multiple linear regression model, with salary as the dependent variable, and several variables that had the potential to affect salary on the right hand side of the equation. These were four job functions (consulting, finance, marketing/sales, and management), five industries (government/non-profit, manufacturing, high tech services, financial services, and general services), previous work experience, the size of the company, whether or not the job was local, and whether or not the student majored in business as an undergraduate.

The regression equation is as follows:

$$\text{Salary} = \beta_0 + \beta_1\text{MANAGEMENT} + \beta_2\text{CONSULTING} + \beta_3\text{MARKETING} + \beta_4\text{WA} + \beta_5\text{EXPERIENCE} + \beta_6\text{COMPANYSIZE} + \beta_7\text{FINANCIALSERV} + \beta_9\text{GOVT} + \beta_{10}\text{GENERALSERV} + \beta_{11}\text{MANUFACTURING} + \beta_{12}\text{UGDEGREE}$$

In this model, the variables MARKETING, CONSULTING, MANAGEMENT and FINANCE were binary variables that indicated which function an MBA was hired to serve. To avoid the dummy variable trap of including a complete set of dummy variables and a constant, FINANCE, the most common job function was excluded from the model.

Similarly, the job industry variables (FINANCIALSERV, GOVT, GENERALSERV, MANUFACTURING, and HIGHTECHSERV) were a set of all the possible job industries. High tech services was left out because that was the most common job industry.

WA was another binary variable, to see what effect being in Washington had on the salary of a job. The variable EXPERIENCE shows the number of years of work experience the student has.

The variable COMPANYSIZE measured the size of the company in terms of number of employees. Company size was measured on a scale of 1-4, with 1 being the smallest, and 4 being the largest. While actual numbers for the company size would have been ideal, this data was not available. The model tests to see if company size has any affect on the salary of the position.

The last variable considered by the model was UGDEGREE, which was another binary variable to see whether completing a business major as an undergraduate affected post-MBA salary.

Statistical significance in any one of these variables would help the MBA careers services office because it could focus the office's search for job openings. For example, if the model discovered that being Washington had a positive coefficient that was statistically significant, the office could attempt to find more career connections within Washington State, as opposed to elsewhere in the country.

Results

The results of the regression showed four variables to be statistically significant; EXPERIENCE, WA, GOVT, and COMPANYSIZE. It was not possible to draw any conclusions from the other variables at a 5% (or even 10%) level.

The factor with the strongest correlation was previous work experience. According to the model, the average return to an additional year of work experience was $1720.93 with a standard deviation of $273.27.

The variable WA had a coefficient of -$3827.09 with a standard error of $1578.939. Because this standard error is so large, it is hard to draw any strong conclusions about the coefficient, but it is possible to say that jobs found with Washington State paid worse overall than those outside of the state.

The variable for the government/non-profit industry had an incredibly negative affect on salaries. On average, government/non-profit jobs paid $13,495.80 less than jobs in the corporate world. The standard error for this measurement was $4,971.52.

Company size was the last factor to show statistical significance. The coefficient of $1,335.33 shows that larger company sizes tend to mean higher salaries. However, the relatively large standard error of $631.79 prevents any exact conclusions about this data.

Conclusions

The results of regression were very surprising. Many factors that career counselors think strongly affect salary (such as job function and undergraduate degree) showed no actual significance in the regression. However, some variables such as company size showed an unexpectedly strong correlation to salary.

The return to previous professional work experience on salary is the most well-known and significant of all the factors. The small standard error and high t-statistic show to a high degree of accuracy the return to additional work experience.

Another well-known fact is that government/non-profit positions pay much worse than corporate positions. Career counselors can try to find corporate positions for these students to fill instead of government/non-profit jobs, but generally, students take these positions for reasons of personal interest.

Knowing that jobs outside of Washington state pay more may help the career services office direct more of it's attention to finding recruiters outside of the state. However, these higher salaries are more likely attributed to highly qualified students being competitive in the national job market.

The positive correlation to larger companies is very good news for career counselors. This indicates that in general, larger companies offer higher salaries than smaller companies. Because contacts in large companies are easy to find, and multiple positions are available within one company, recruiting efforts can be much more focused towards larger firms.

Appendix

Dependent Variable: SALARY
Method: Least Squares
Date: 12/08/03 Time: 12:19
Sample: 1 405
Included observations: 405

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	51872.25	3412.505	15.20064	0.0000
MANAGEMENT	-1078.020	2194.134	-0.491319	0.6235
CONSULTING	3887.707	2501.551	1.554119	0.1210
MARKETING	2449.709	2052.928	1.193276	0.2335
WA	-3827.086	1578.939	-2.423834	0.0158
EXPERIENCE	1720.926	273.2744	6.297427	0.0000
COMPANYSIZE	1335.332	631.7915	2.113565	0.0352
FINANCIALSERV	3628.135	2298.714	1.578333	0.1153
GOVT	-13495.80	4971.515	-2.714625	0.0069
GENERALSERV	-121.3491	2007.537	-0.060447	0.9518
MANUFACTURING	746.1447	2316.398	0.322114	0.7475
UGDEGREE	1059.595	1518.273	0.697895	0.4857

R-squared	0.144187	Mean dependent var	64608.29
Adjusted R-squared	0.120233	S.D. dependent var	15383.11
S.E. of regression	14428.72	Akaike info criterion	22.02101
Sum squared resid	8.18E+10	Schwarz criterion	22.13964
Log likelihood	-4447.255	F-statistic	6.019335
Durbin-Watson stat	1.959420	Prob(F-statistic)	0.000000