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Employer Demand for College Graduates with High Grades

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This study analyzes the preferred grade point average (GPA) that employers are looking for when hiring a college graduate. A survey was emailed to employers who recruit students from the College of Agricultural Sciences and Natural Resources at Oklahoma State University. Previous research shows that employers primarily seek soft skills in college graduates, which are difficult to assess. Studies also show that GPA scores, which are easy to assess, are correlated with soft skills, which helps employers make an estimated guess as to whom the company would desire. The survey asks employers to undergo a simulated hiring decision where they must choose between different candidates with different GPA scores and salaries. Their simulated hiring decisions provide unique insights into employers' preferences for grades among college graduates. Surprisingly, the results show a possible, but mild preference for 3.0 over 2.5 GPA scores, and that employers prefer a 2.5 GPA over a 3.5 GPA and higher. Additionally, larger employers placed greater emphasis on high grades.

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Of the many reasons one should attend college, the potential for increases in salary and job opportunities is probably the most important. College graduates rarely have difficulty finding a job, though not necessarily their first job of choice. The demand for college graduates and their associated salary premiums is growing, and shows no signs of dissipating.

Employers are currently planning to hire 17% more college graduates from the class of 2007 than they did from the class of 2006. In addition, employers, from all regions of the United States, are planning to increase starting salary offers from 4 percent to more than 10 percent this year (*National Association of Colleges and Employers*). Of course, not all college degrees are the same; neither are all college graduates the same. Some students receive better career opportunities because they experience a more successful college career. What constitutes a "successful college career?" What do employers look for in a recent college graduate's resume?

In defining a good student, employers look for numerous skills within a student's talent set. A number of studies have attempted to identify what skills employers generally look for, and the general consensus is that they seek skills referred to as "soft" skills. Soft skills include interpersonal skills, meaning an ability to get along well with others, work well with others, and lead groups. Communication skills, integrity, a strong work ethic, and professionalism are "soft skills" employers are looking for in college graduates. In 2007, the National Association of Colleges and Employers listed the top five personal qualities employers seek as (1) communication skills, (2) honesty/integrity, (3) teamwork skills (ability to work well with others), (4) strong work ethic, and (5) analytical skills. More tangible and measurable attributes ranked lower, such as grades of B or higher (which was ranked 18 out of the 20 skills studied) (NACE, 2007).

More specific to agricultural colleges, Litzenberg and Schneider (1987) targeted employers of agricultural economics and agribusiness degrees through a survey, containing 500 employer responses. The authors compared seventy-four attributes in six general categories of interpersonal characteristics, communication skills, business and economics skills, technical skills, computer skills, and previous work experience. Of the six categories, interpersonal characteristics were the most important and communication skills ranked second. Self-motivation, a positive work attitude, high moral character, the ability to work well with others, the ability to listen and carry out instructions, and the ability to give clear and concise instructions also topped the list of important skills (Litzenberg and Schneider, 1987).

While these soft skills are desired, employers have no direct way of measuring a college graduate's possession of soft skills. Thus, employers must rely on indirect measures of soft skills, focusing on qualifications and accomplishments listed on one's resume that are positively correlated with soft skills. One such indirect measure is the student's grade point average (GPA) in college. Using an experiment where researchers directly measured soft skills through

a variety of team exercises, Rubin, Bommer, and Baldwin (2002) demonstrated that a higher GPA is positively correlated with the soft skills of communication, initiative, decision-making, and teamwork skills.

Therefore, while employers are seeking college graduates with superior soft skills, they can identify these students partially by their grades (of course, grades may be affiliated with other non-soft skills also). Are employers aware of this correlation between grades and soft skills? According to a recent study, employers are indeed aware. Through a survey of college graduate employers, Briggeman, Henneberry, and Norwood (2007) found that employers do find grades useful for determining a job candidate's problem solving skills, character, communication skills, and ability to work well with others. Judging students partially on their grades in college allows employers to make a more educated guess on the graduates' potential contribution to the organization.

Objectives

While such studies have illustrated that grades are important, they have failed to identify exactly what range of grades employers prefer. Do employers prefer graduates with perfect grades, or do they just set minimum grade point average (GPA) requirements for all new hires? To what extent do employers differ in their preferences for grades? This study utilizes survey responses from over 450 employers of college graduates to answer this question. Specifically, the survey responses can be used to determine the exact range of grades employers seek in college graduates, and how preferences for grades vary with the employer's size.

Survey Description

The previous sections describe how employers use grades to partially determine which job candidates possess the qualifications employers deem most important. Better understanding the exact grades employers prefer is the objective of this study, and is accomplished by using an internet survey of college graduate employers . Within the internet survey, employers are asked to conduct a simulated hiring decision. The survey is akin to a choice experiment, and is described using the choice experiment analogy first. The survey asked employers to consider four candidates who were identical in all ways, except their graduating GPA. Each candidate had a GPA of 2.5, 3.0, 3.5, or 4.0; these grades are equivalent to a C, B, B+/A-, and A average, respectively. Those candidates with a higher GPA required a higher salary, and the salary premium varied randomly across employers. For example, one employer may only have to pay $100 more in salary to hire the 3.5 GPA candidates instead of the 3.0 GPA candidates, while another employer may have to pay up to $10,000 more. Higher grades are always associated with higher premiums based on the assumption that higher grades are preferred, and from pretests where subjects indicated a discount assigned to higher grades is confusing.

Employers were asked to assume the open position was for the average job at their organization, requiring a college degree. Then, each respondent was asked to choose which one of the four candidates they would hire. Because this entails a hypothetical hiring decision, as well as hypothetical candidates, the employer's choice will mirror real hiring decisions as though the candidates are real people who must be paid a real salary.

This survey conducts what can be considered a simulated hiring decision. The job candidates are hypothetical. The simulated hiring decisions are accompanied by a number of contingent valuation questions regarding other candidate attributes the employer may be interested in. The simulation is much like a vending machine for grades. The employer goes to the simulated vending machine, views the price of each grade point average, and selects the grade point average (GPA) such that the benefit minus the cost is largest. For example, the employer may prefer a 3.5 to a 3.0 GPA, but if the premium assigned to the 3.5 GPA is especially large relative to the 3.0 GPA, the employer may select the 3.0 GPA.

In addition to grades, the employer could choose levels of other college graduate attributes. The actual question presented to employers is shown in the figure below. Employers were given a basic candidate with low grades and low levels of other attributes at a base salary. Then, the employer could choose a higher level for any given attribute, at a cost shown beside the attribute. Each time an attribute is upgraded to a more desirable level, the graduate's salary increases. Thus, the employer essentially builds its ideal job candidate based on its preferences and the cost of the inputs, with the inputs here being the attributes grades, internship experience, academic awards, foreign language skills, leadership positions, and recommendation letters.

For the purposes of this study, only selections made for grades are considered. Note that due to the nature of the question, the survey asks employers for their preference for grades, holding constant internship experience, awards, foreign language skills, leadership positions, and recommendation letters. For example, if an employer focuses mainly on a graduate's ability to work well with others, even if grades are correlated with working well with others, and if the employer believes an internship experience is a better signal of interpersonal skills, the employer may answer the question by paying more for internship experience but not grades. It would then appear the employer would not value grades, when in fact, the employer would value grades in the absence of internship experience.

Figure 1. Survey Question Presented to Employers

Notes: the actual baseline salary used in the survey was $25,000. The premiums shown in the figure above are randomly chosen, and will be higher or lower across employers.

Survey invitations were emailed through the Oklahoma State University Career Service Office to 4,401 employers, while 507 responses were received, for a response rate of 12%. The Career Services Office did not allow reminders to be sent out, partially explaining the low response rate. Another reason for the low response rate is the difficulty of the survey. Answering the question shown in Figure 1 requires basic computer competency and deliberate thought, and more respondents are apt to refuse the survey compared to more simple surveys.

The survey consisted of many different questions, asking employers their preferences among several aspects of one's skill set and education. Though for some studies all this information is useful, this particular information and study will solely observe students and their GPAs. Table 1 provides descriptive statistics of the respondents. While 15% of them consider themselves to be a government organization, 20% are said to be manufacturers, and 43% classified themselves as "other" when asked about organization type.

Table 1. Employer Demographics (Sample Size = 453)

Organization Type		Percent of Employers Who Regularly Hire Degree	
Government Organization	15%	Accounting	39%
Manufacturer	20%	Business Communications	24%
Financial Service Provider	9%	Finance	30%
Consultant	10%	Economics	15%
Retailer	4%	Management	38%
Wholesaler	3%	Marketing	33%
Other	42%	Ag Econ / Ag Bus	19%
		Other	30%
Number of Full-Time Employees			
< 10	4%		
10-49	16%		
50-59	13%		
100-500	22%		
> 500	45%		

Table 1 also illustrates the fact that many employers hire graduates from business colleges. In fact, 64% of employers stated they regularly hire graduates with accounting, business communications, finance, economics or agricultural economics, management, or marketing degrees. Table 1 also shows 45% of the companies surveyed have 500 or more full-time employees, 22% have 100-500 employees, 13% have 50-59 employees, 16% have 10-49 employees, while 4% have 10 or less employees.

Methodology

The objective of this research is to use the above survey results to study what range of grades employers most prefer, and if possible, to measure their willingness to pay for those higher grades. The survey results are analyzed through regression analysis, using only those methods taught at the undergraduate level of economics or agricultural economics study. This regression is used to relate candidate attributes (e.g. GPA, salary premium) to the probability of being hired in the hiring simulation.

Let Y_i be a variable that equals 1 if the hypothetical job candidate is hired and zero otherwise. Similarly, let *3.0GPA*, *3.5GPA*, *4.0GPA* be dummy variables that equal 1 if the candidate has a 3.0, 3.5, or 4.0 GPA and zero otherwise. No dummy variable is made for candidates with a 2.5 GPA, as it will be reflected in the regression intercept. The variable *Premium* indicates the additional money in annual salary the employer must pay, above the $25,000 base salary set for the 2.5 GPA candidate. For example, referring to Figure 1, the value of *Premium* for the 4.0 candidate is $3,000. The variable *Size* denotes the number of employers the hiring organization maintains. This is a qualitative index variable, which equals 1 if the organization maintains less than 10 workers, 2 for 10-49 workers, 3 for 50-99 workers, 4 for 100-500 workers, and 5 for more than 500 workers.

The variable *Size* is used to interact with the grade dummy variables, which allows preferences for higher or lower grades to depend on the size of the employer. The regression models used to estimate employers' preferences for grades are specified as follows. Two regression models are estimated. One simply includes the grade and salary variables in a regression model, and the other uses interaction terms between the grade and size variables. The conceptual regression models are as follows.

(1: Linear Model) $Y = Probability\ of\ being\ hired = a_0 + a_1(3.0GPA) + a_2(3.5GPA) + a_3(4.0GPA) + a_4(Premium) + error$

(2: Interaction Model) $Y = Probability\ of\ Being\ Hired = a_0 + a_1(3.0GPA) + a_2(3.5GPA) + a_3(4.0GPA) + a_4(3.0GPA)(Size) + a_5(3.5GPA)(Size) + a_6(4.0GPA)(Size) + a_7(Premium) + error$

By estimating the regression coefficients (a_i) one can better understand the impact a hiring decision has on the probability of being hired, the sensitivity of employers to salary premiums, and the role of employer size in hiring decisions. To explain the interpretation of the coefficients, the following sub-section performs calculus on equations (1) and (2).

Interpretation of Coefficients: Linear Model

To determine how a higher GPA increases the chance of being hired, one may take the derivatives of the above equations with respect to the variables *3.0GPA*, *3.5GPA,* and *4.0GPA.* For example, the derivative of (1) with respect to *3.0GPA* is

(3) $\partial(Y)/\partial(3.0GPA) = a_1$.

Recall that the *3.0GPA* variable is an indicator that equals 1 if the candidate has a 3.0 GPA and zero otherwise. If *3.0GPA*, *3.5GPA,* and *4.0GPA* are all equal to zero, the candidate possesses a 2.5 GPA. The predicted probability of a simulated candidate with a 2.5 GPA being hired, using the linear model, is given by the intercept. The value of *Premium* for the 2.5GPA is always zero. If instead a candidate has a 3.0 (3.5, 4.0) GPA and the salary premium is zero, the probability of being hired increases by the value of a_1 (a_2, a_3). If a salary premium does exist for these candidates with greater grades, the probability of being hired changes by an amount equal to a_4 times the premium in the linear model.

Observing (3), a positive and significant value for a_1 indicates that possessing a 3.0 GPA, as opposed to a 2.5 GPA, increases the probability of being hired (assuming the cost of the higher GPA is zero). Similarly, positive and significant values for a_2 and a_3 suggest employers prefer a 3.5 and a 4.0 GPA over a 2.5 GPA. However, to determine if an employer prefer a 3.5 GPA over a 3.0 GPA, one would have to determine whether $a_2 > a_1$.

Interpretation of Coefficients: Interaction Model

It could be that larger employers have different preferences for grades than smaller employers. To test for this effect, the *Model with Interactions* includes interactions terms for employer size and the grade dummy variables. For example, in the *Interaction Model*, the derivative of (2) with respect to 3.0GPA is

(4) $\partial(Y)/\partial(3.0GPA) = a_1 + a_4(Size)$

If a_4 is positive and significant, this indicates the willingness-to-pay for a 3.0 graduate relative to a 2.5 graduate increases with employer size. Put differently, larger employers place more emphasis on high grades. Coefficients a_5 and a_6 have a similar interpretation to a_4.

Hypotheses

This study makes several hypotheses regarding the coefficients in the regression models (1) and (2). The first hypothesis (H1), is that employers always prefer higher grades to lower grades, implying that $a_3 > a_2 > a_1 > 0$. The second hypothesis (H2) is that a higher salary premium decreases the desirability of a candidate, implying that a_4 should be statistically less

than zero. The third hypothesis (H3) states that larger employers place a greater emphasis on high grades than smaller employers.

The third hypothesis assumes that large employers have an established candidate screening protocol, which uses grades as a screening device. For example, conversations at Career Fairs reveal that Archer Daniels Midland will only consider job candidates with a GPA above a 3.0. Smaller firms, it is hypothesized, have a less formal screening procedure and will be more likely to consider candidates with lower grades. In the next section, the models in (1) and (2) are estimated using standard ordinary least squares regression, and used to test Hypotheses H1-H3.

Results

Two regression models have been used to analyze the employer survey. The Linear and Interaction Models provide surprising results. Regression results for the Linear Model, shown in Table 2 below, indicate that a_0 and a_1 are both positive, as expected, but the p-values for each are not significant at the 5% level. Contrary to expectations, the coefficients a_2 and a_3 are both significant and negative at the 5% level, indicating that employers actually prefer graduates with a 2.5 or 3.0 GPA relative to 3.5 or 4.0 GPA. Lower grades, for employers as a whole, are preferred, at least over the range considered. The likelihood is that employers still prefer a 2.5 GPA over a 2.0 GPA (which is the minimum GPA required for graduation), but the data cannot attest to this. Finally, also contrary to expectations, the coefficient on *Premium* is not significant, indicating that employers' simulated hiring decisions are not sensitive to the candidates' salaries.

(5: Linear Model Results) Y = Probability of being hired = 0.3077 + 0.0280(3.0GPA) – 0.0476(3.5GPA) – 0.2031(4.0GPA) + 0.0000(Premium) + error

The Interaction Model adds three variables to the linear model: interaction terms for grades and employer size. Recall that *Size* is a qualitative measure of the number of employees the respondent maintains, where a larger value indicates more employees.

As in the linear model, Table 3 shows the coefficients on the 3.5 and 4.0 dummy variables are negative and significant, and the variable for salary (*Premium*) is insignificant. The interaction terms are all positive and significant, indicating that the larger the employer, the more the employer prefers job candidates who have a GPA above a 2.5. The Interaction Model can be difficult to interpret due to the interaction variables.

(6: Interaction Model Results) Y = Probability of Being Hired = 0.3077 – 0.0447(3.0GPA) – 0.1682(3.5GPA) – 0.2135(4.0GPA) + 0.0191(3.0GPA)(Size) + 0.0316(3.5GPA)(Size) + 0.0027(4.0GPA)(Size) – 0.0000(Premium) + error

Table 2. Results of Linear Model

Variable	Estimated Coefficient *(p-value)*
Intercept	*0.3077** *(0.0000)*
3.0 GPA	*0.0280* *(0.1396)*
3.5 GPA	*-0.0476** *(0.0136)*
4.0 GPA	*-0.2031** *(0.0000)*
Premium	*0.0000* *(0.5205)*

** denotes coefficients which are significant at the 5% level.*

Notes: dependent variable = 1 if hypothetical candidate is hired, zero otherwise

Table 3. Results of Interaction Model

Variable	Estimated Coefficient *(p-value)*
Intercept	*0.3077**
	(0.0000)
3.0 GPA	*-0.0447*
	(0.2588)
3.5 GPA	*-0.1682**
	(0.0000)
4.0 GPA	*-0.2135**
	(0.0000)
*3.0 GPA * Size*	*0.0191**
	(0.0518)
*3.5 GPA * Size*	*0.0316**
	(0.0013)
*4.0 GPA * Size*	*0.0027**
	(0.0000)
Price	*-0.0000*
	(0.5233)

* *denotes coefficients which are significant at the 5% level.*
Notes: dependent variable = 1 if hypothetical candidate is hired, zero otherwise

To articulate how the predicted probability of a hypothetical candidate being hired changes with grades and employer sizes, Table 4 uses the Interaction Model results to forecast hiring probabilities under different assumptions. Since the hiring decision is hypothetical, the level of probabilities is not important. How the probabilities change under different grade and employer size assumptions is useful for understanding the role of grades in the job market though. As the employer size increases from the smallest category (less than 10 employees) to the largest (more than 500 employees) the probability of a 3.0 or 3.5 graduate being hired increases by 8-13 percentage points. While the interaction term for 4.0 and *Size* is positive and significant, the hiring probability is virtually unchanged as the employer size grows.

Table 4. Probability of Various Candidates Being Hired in Simulated Hiring Decision

Grade Point Average of College Graduate (4.0 max)	Size of Employer (number of employees)	Probability of Being Hired
2.5	*irrelevant*	31%
3.0	<10	28%
3.0	10-49	30%
3.0	50-99	32%
3.0	100-500	34%
3.0	>500	36%
3.5	<10	17%
3.5	10-49	20%
3.5	50-99	23%
3.5	100-500	27%
3.5	>500	30%
4.0	<10	10%
4.0	10-49	10%
4.0	50-99	10%
4.0	100-500	11%
4.0	>500	11%

Notes: the probabilities in the third column are calculated by plugging in the appropriate variable values in (6).

Table 4 is revealing in that even for the largest of employers, they still prefer the 2.5 GPA over a 3.5 GPA. A 3.0 GPA is still preferred over the 2.5 GPA for the larger employers, which is consistent with the stylized fact that many large employers only consider graduates with a 3.0 GPA or better. Whether this difference is statistically significant, however, is unclear and requires statistical tests beyond those taught at the undergraduate level of agricultural economics.

Hypothesis Test Results

The first hypothesis (H1) states that employers always prefer higher grades than lower grades. From our results we can see that for the employers as a whole, starting from a 2.5 GPA, higher grades either do not impact or detract from the desirability of a job candidate. Thus, H1 is rejected. The H2 hypothesis that a higher salary premium makes the desirability of a candidate go down is also rejected. Given the result of H1, this is not surprising. Finally, the third hypothesis, H3, states larger employers place greater emphasis on higher grades. This hypothesis is not rejected, due to the significance of the interaction terms in the Interaction Model.

Conclusion

Building an impressive resume often requires tough choices. Students can set aside more time for studying, but this may come at the expense of leadership positions in clubs or gaining work experience. Grades, leadership positions, and work experience are all valued by employers. To help students allocate their resources effectively, this study seeks to measure, through a survey of college graduate employers, the importance employers place on increasing one's grade point average (GPA) from a 2.5 to a 3.0, 3.5, or 4.0 using a survey of college graduate employers.

Contrary to expectations, increasing GPA above a 2.5 either had no impact or detracted from the marketability of a graduate. However, the data do not indicate why higher grades reduce the appeal of a graduate though. One reason could be that employers actually avoid students with higher grades. This could be the case. In his popular book *Pushing the Envelope* (1999), author and CEO Harvey Mackey states, "I know of a large publicly held company that would never hire an A student as a salesperson, because anyone whose grade conformed so closely to conventional wisdom was sure to lack a quality the company values much more than wrote knowledge: creativity," (page 166).

The result that a 3.0 GPA is preferred to a 3.5 GPA is perhaps surprising. Indeed, there is scientific evidence to the contrary. Perhaps the counterintuitive result is due to the particular survey design? Indeed, using an alternative survey design, Curry (2007) found that the most preferred GPA from employers' view is in the range 3.5-3.75. Curry also found that grades in the range 3.25-2.50 were preferred over the range 3.0-3.24, and grades in the range 3.0-3.24 are preferred over the range 2.5-2.99.

The difference in these results and those in Curry may be due to the type of survey question used. Curry's survey forces employers to consider GPA when making their simulated hiring decision. In this survey, the employer could elect to consider GPA, but if grades are not particularly important they could simply abstain from answering part of the survey. The survey in this study uses the 2.5 GPA graduate as the default. If employers generally ignore grades when they answer the question shown in Figure 1, the regression results will interpret

the irrelevance of higher grades to imply employers prefer lower grades. Repeating this survey while allowing the default GPA to vary could test whether this is the case.

While many studies have documented the importance of high grades to employers hiring college graduates, only recently have researchers asked exactly what range of grades employers prefer to see on job applicants' resumes. Combining the results of this and the Curry study, the research linking grades and hiring decisions is tenuous. It is unclear what drives the differences between this and the Curry study, but the survey design may be an important factor. What is clear is that employers' preferences for grades are complex, higher grades are not always better, and more research is warranted before one can identify the optimal grade range.

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