GRADES VS UNIVERSITY PRESTIGE? A STUDY ON THE RETURNS TO EDUCATION

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ABSTRACT

This is a study determining which factor is a stronger return to education in a post-undergraduate setting: Grade Point Average (GPA) or the perceived "prestige" of the University attended. To classify what is considered "prestigious" and non- "prestigious", I used rankings from the *U.S News Best Colleges Rankings* to classify the University of California campuses onto two separate tiers based on these rankings. I implement a survey on Amazon Mechanical Turk, in which subjects which consist of a variety of individuals with different backgrounds are asked whether they would prefer to hire a job candidate with a higher GPA from a lower tier university versus a job candidate with a lower GPA from a higher tier university. This survey data revealed that subjects have a strong preference for candidates with a higher GPA. This preference still holds true even when filtering out respondents who do not have any hiring experience. The implications are that individuals will re-evaluate their preferences when applying to a university.

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Motivation:

As the cost of tuition for universities continues to increase and be a burden for many students, there is also an increasing pressure to maximize the value of a student's undergraduate education. When selecting a university to attend for undergraduate education, prospective students and their families are interested in what they can get out of their degrees after graduating (Han, Bae, Sohn, 2012). A university with higher academic prestige (i.e., larger endowment, more research funding, have greater academic facilities, more media recognition) tends to be more expensive than a less prestigious university (Steinberg, 2010). On the other hand, Grade Point Average (GPA) is a value given to a student to measure ability in completing course expectations. Since GPA is measured on the same scale across all U.S universities, we will see students in both non-prestigious and prestigious universities with a 4.0 GPA. Since GPA is the standard tool to measure academic ability in critical thinking, problem-solving, and synthesis, skills valuable to the workplace, GPA is often used in the labor market, especially for recently graduated students who lack relevant job experience (Adams, 2013). It is commonly assumed that prestigious universities can be more challenging and rigorous. This implies that a student that graduates from these universities with a 4.0 GPA will be the most prepared candidate for the labor force, becoming in essence the dominant choice for any employer. However, for cases in which a student with a higher GPA attends a non-prestigious university compared to a student with a lower GPA attending a prestigious university, it is not known who will be considered more qualified for a job position. The question is what provides a greater return on education. Is it attending a prestigious university or a high GPA? A measure that captures returns on education is getting hired for a job. Although, it is speculated that the

university where an individual studied does matter to a hiring manager, how it compares to other qualities such as GPA, work experience, clubs/orgs, is an open question.

With that in mind, the question I address is whether individuals view GPA as a stronger signal to employers than university prestige. This informs whether individuals should be willing to attend a more prestigious university and obtain a lower GPA than obtaining a higher GPA from a less prestigious university. If GPA is most important, then students should focus on attending universities where their academic performance will be greatest rather than simply the prestige of a university. For many families, whose main focus is getting students to attend the best university possible, the economic implications of the results of this study can help families make informed decisions and budget in a way that will optimize the student's return on education while lowering costs.

Literature Review

Existing works of literature analyzes the signaling weight of university prestige and academic performance. Researchers Dale and Kreuger (1999) studied the differences in long-term wage earnings between students who went to prestigious universities versus those who do not. By using SAT (Scholastic Assessment Test) scores, a required entrance exam to most American universities, they were able to control for students' abilities pre-university, they were able to remove selection bias where students with higher academic ability are usually the ones accepted to a prestigious university. That is, when using identical SAT scores, they measured wage earnings from students who attended prestigious universities and compared them to students who were accepted to prestigious universities but decided to attend less prestigious ones. They found that there was no significant earnings advantage to students who did attend prestigious universities.

However, there are some interesting studies on outcomes when studying specific groups of individuals. Professors Ge, Isaac, Miller (2019) follow up on the study by Dale and Kreuger and found that differences in earnings between men who attended prestigious universities and non-prestigious universities holding SAT scores constant are negligible. However, for women, there are significant effects. For example, women who attend an elite university experience a 14% increase in earnings. However, there is not enough supporting evidence to claim if whether this has something to dowith the university, as these women also have other differences – they are 4% less likely to be married and have greater labor participation.

According to a study by Professor Raj Chetty (2017), low-income students also benefit greatly from attending prestigious universities and argue that these universities offer greater social mobility. Specifically, they find that Ivy League universities have a success rate of 60% in bringing students from the bottom quintile to the top quintile of the income distribution. On the other side, certain non-selective universities have similar rates of success in social mobility, implying that further study is needed to determine which university qualities enhance students' upward mobility.

I contribute to this literature by studying how university prestige and GPA affect hiring as opposed to earning outcomes by collecting individuals' preferences.

Methodology:

I collected survey data to capture an individual's preferences between university prestige and GPA. To do this, I recruited 100 subjects on Amazon Mechanical Turk (Mturk) to complete a 10-minute Qualtrics survey. The survey collected information on whether the individual has any hiring experience, as well as basic demographic information (e.g., age, gender, education, household income, employment industry). Subjects then took part in a

discrete choice experiment and received thirteen scenarios wherein each scenario they took the role of a job recruiter and were asked to choose between two candidates: one that attended a prestigious university (labeled as Tier1) and another that has attended a non-prestigious university (labeled as Tier0). The Tier1 option will always have a lower or equal GPA. I used the 9 undergraduate campuses that form part of the University of California (UC) system and classified them as Tier1 or Tier0. The specific universities for each candidate are randomly selected from these two sets of universities for each scenario. To classify universities, I looked at the *US News 2020 Best Colleges*

Rankings. The rankings are reported in **Table 1**.

Table 1: University of California Campus Rankings[1]

University Name	Public University Rank	National University Rank	Tier
1 Universities (Prestigious Universities)			
UC Los Angeles	1	20	
UC Berkeley	2	22	
UC Santa Barbara	7	34	
UC Irvine	9	36	
UC San Diego	10	37	
UC Davis	11	39	
Tier 0 Universities (Non-Prestigious)			
UC Santa Cruz	34	84	
UC Riverside	39	91	
UC Merced	44	104	

* Note: Given that I see a significant difference in rankings between UC Davis and UC Santa Cruz, as well as the fact that each Tier presents similarly ranked universities, it became intuitive to split the universities in the manner shown on the table.

[1] Public University Rank and National University Rank per US News 2020 Best Colleges Rankings

GPAs are determined using Qualtrics software that randomizes GPA from an interval of 2.0-4.0. As most universities do not graduate students who have lower than a 2.0 GPA, we do not include GPAs lower than 2.0.

Additionally, we exclude scenarios in which the Tier1 candidate has a higher GPA than the Tier0 candidate, due to the assumption that Tier1 candidates are preferred if they have a higher GPA. After selecting their preferred candidate for each scenario, subjects are directly asked what they believe is a stronger signal for better job outcomes: GPA or university prestige.

To quantify the importance of GPA and university prestige, I estimate the following ordinary least square model:

$$select_{ij} = \alpha + \beta_1 GPA_{ij} + \beta_2 Tier1_{ij} + \alpha_i + \mu_{ij}$$

where *select* is a dummy variable indicating whether the candidate was selected, *Tier1* is a dummy variable that the candidate attended a prestigious university, and *GPA* is a continuous variable that measures the candidate's GPA. The dependent variable *select* represents the probability of getting selected, whose values range from [0,1]. The subscript *i* corresponds to the respondent and the subscript *j* to each of the 13 choices. The model includes individual fixed effects, α_i.

- β_1 is the unit change in GPA. For example, say there is an individual who went from a 3.0 GPA to a 4.0 GPA. The change in the probability in the likelihood they will be selected will be β_1.
- β_2 is the unit change in Tier1. An example of this a student who changed from a non-Tier1 university to a Tier1 university. However, our design does not allow us to separately identify the effect of the Tier 1 university from having a lower GPA. Therefore, β_2 may also reflect the effects of having a lower GPA than the alternative

candidate. Additionally, based on the design of the study, it is important to note that a prestigious university effect might simply reflect the effect from a lower GPA.

Results

When analyzing these results, it is important to note certain characteristics of the survey respondents as these characteristics play a factor in influencing the outcome. These characteristics include gender, household income, educational status, hiring experience, and general preferences between GPA and University prestige (See Appendix). Collecting basic demographics from the individuals show that 65% of respondents were male, with a predominant household income between $25,000-$50,000. Furthermore, 66% of the respondents believe that GPA helped them most in obtaining their first job, as opposed to 19% who believe that the university[2][3]:

Table 2. Linear regression, absorbing indicators

select	Coef.	St.Err.	tvalue	pvalue	[95% Conf	Interval]	Sig
GPA	.045	.018	2.49	.013	.01	.081	**
Tiers	-.412	.022	-18.73	0	-.455	-.369	***
Constant	.571	.062	9.26	0	.45	.691	***
Mean dependent var		0.500	SD dependent var			0.500	
R-squared		0.197	Number of obs			2600.000	
F-test		309.672	Prob > F			0.000	
Akaike crit. (AIC)		3209.367	Bayesian crit. (BIC)			3226.957	

**** p<.01, ** p<.05, * p<.1*

B1 – B2=0
(1) GPA - Tiers = 0
F (1, 99) = 100.84
Prob > F = 0.0000

[2] Out of the 72% of the respondents that have reported to have some hiring experience, almost 30% of respondents reported to have hired at least 10 employees.

[3] The regression code used in STATA is: areg select GPA Tiers, absorb(SurveyCode) robust.
This controls for individual fixed effects.

As seen in **Table 2** the results demonstrate that, on average, a one unit increase in GPA leads to a .045 unit increase in the probability of getting selected. This effect is statistically significant with a p-value of .045. We also find that being a candidate from a Tier1 university decreases the probability of being selected. However, as mentioned, this can be interpreted as the effect of having a lower GPA. **Table 3** also shows similar results when only including those individuals who have hiring experience, which again accounted for 72% of the respondents.

Table 3. Linear regression, absorbing indicators when respondents have hiring experience

select	Coef.	St.Err.	tvalue	pvalue	[95% Conf	Interval]	Sig
GPA	.042	.021	2.01	.045	.001	.083	**
Tiers	-.363	.026	-13.87	0	-.415	-.312	***
Constant	.556	.071	7.78	0	.416	.696	***

Mean dependent var	0.500	SD dependent var	0.500
R-squared	0.155	Number of obs	1872.000
F-test	166.683	Prob > F	0.000
Akaike crit. (AIC)	2408.611	Bayesian crit. (BIC)	2425.215

So far, both tables show the same thing, a higher GPA is more preferred than attending a prestigious university. What is most surprising is that attending a Tier1 university has a negative outcome than attending a nonTier1 university. However, this is most likely due to the design of the study in which Tier1 universities are matched with a lower or equal GPA than that of a non-Tier1 university. A lower GPA is likely perfectly colinear with attending a Tier1 university. Furthermore, a subset that captures only particular choices in which I am comparing candidates with the same GPA. That is, I compare an individual's preference in choices where both candidates have the same GPA but attend different tiered universities. When imposing this condition onto our regression, I estimate the following:

Linear regression, absorbing indicators

select	Coef.	St.Err.	tvalue	pvalue	[95% Conf	Interval]	Sig
GPA	0	.199	0.00	1	-.399	.399	
Tiers	.148	.135	1.10	.276	-.122	.418	
Constant	.426	.588	0.72	.472	-.752	1.604	

Mean dependent var	0.500	SD dependent var	0.502
R-squared	0.022	Number of obs	108.000
F-test	0.606	Prob > F	0.549
Akaike crit. (AIC)	160.374	Bayesian crit. (BIC)	168.421

*** p<.01, ** p<.05, * p<.1*

Here we can see that when comparing with identical GPA, the effects of going to a non-Tier1 university to a Tier1 university are positive, providing evidence that the assumption that when holding GPA constant, Tier1 is preferred. However, this result suggests that respondents are not averse to picking candidates from Tier1 and provides evidence that there is simply a strong preference for a higher GPA regardless of Tier.

Conclusion

This paper features a debate well known to high-school seniors and incoming undergraduate students when reviewing university acceptance letters and committing to the ultimate choice of which university to attend. Some argue that academic excellence is a stronger indicator of success in the job market and others argue that the “prestige” of a university is the stronger signal. Quantifying this phenomenon becomes difficult both logistically and due to biases that may arise by simply comparing individuals. These biases that may be the result of unobservable personal factors. By randomizing GPAs matched with a university categorized from either as prestigious or non-prestigious, removing this bias

becomes possible given that comparisons are exclusively between GPA and the university attended. Using this method, my study finds that GPA is a stronger signal, although it gets relatively weaker when only including individuals that have hiring experience. The implications of these results suggest that there should be less emphasis on the prestige a university may signal, but rather on the potential academic performance an individual can have. This can serve as motivation for students who do not have the financial access to attend prestigious universities but do possess high academic ability. These decisions may create less of a financial strain on students, independent of their educational outcomes. It can also increase the incentive for students to attend their local university and perform well academically, instead of traveling large distances to resettle near prestigious universities, thus further decreasing the costs of undergraduate education. For the case of the marginal individual who has financial access to attend a prestigious university, this study may lead the individual to reevaluate the significant weight their academic performance may have.

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Appendix

Gender Characteristics

What is your gender?	Freq.	Percent	Cum.
Female	35	35.00	35.00
Male	65	65.00	100.00
Total	100	100.00	

Household Income

What is your household income in 2019?	Freq.	Percent	Cum.
Less than $12,000	4	4.00	4.00
$12,001 - $25,000	10	10.00	14.00
$25,001 - $50,000	35	35.00	49.00
$50,001 - $80,000	24	24.00	73.00
$80,001 - $100,000	14	14.00	87.00
$100,001 - $200,000	11	11.00	98.00
$200,001+	2	2.00	100.00
Total	100	100.00	

General Preferences between GPA and University attended.

What do you believe helped you the most in obtaining your current, or most recent job?	Freq.	Percent	Cum.
GPA	66	66.00	66.00
The University where you attended	19	19.00	85.00
Other	15	15.00	100.00
Total	100	100.00	

Preferences between GPA and University for job candidates.

What would you consider to be a stronger indicator for a job candidate?	Freq.	Percent	Cum.
A candidate who was educated at a higher ranked university	19	19.00	19.00
A candidate with a stronger GPA	81	81.00	100.00
Total	100	100.00	

Hiring Experience

Have you ever been in a position where you have hired someone for a job?	Freq.	Percent	Cum.
No	28	28.00	28.00

Yes	72	72.00	100.00
Total	100	100.00	