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Determining Future Success of College Students

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I. Introduction

The years that students spend in college are perhaps the most influential years on the rest of their lives. College students face many different decisions day in and day out that may determine how successful they will be in the future. They will choose majors, whether or not to play a sport, which clubs to join, whether they should join a fraternity or sorority, which classes to take, and how much time to spend studying. It is unclear what aspects of college will benefit a person the most down the road. Are some majors better than others? Is earning a high GPA important? Or will simply getting a degree be enough to make a good living? These are a few of the many questions that college students have.

Some students will graduate from school, get interesting jobs, and make a lot of money soon after graduation, while others will struggle to move ahead in the working world. Every student deserves the best chance to be successful after graduation. Some majors have been proven to lead to higher incomes than others. Perhaps, students can increase their chances of being successful simply by choosing certain majors. It is also possible that some majors are simply riskier, lead to less pleasurable occupations, or require particular skills or natural abilities that only a few people have (Scholz, 1996). Therefore, although these majors pay more, they may not necessarily be a better choice for most people. Another possibility is that certain majors attract the brightest students, which could account for the disparity in pay across majors. This can be controlled for by comparing the aptitudes of students in various majors by using standardized test scores. It is obvious some disciplines lead to better pay, but it is important to understand why. If we understand why some majors pay better, then students will be able to choose their majors more wisely.

Another extremely important aspect of a student's college experience is GPA. Many employers use a student's GPA in order to judge job applicants. It is often easier to get a good job with better grades during college (Rumberger, 1997). However, employers also desire traits such as leadership which cannot be measured quantitatively. Students often have to decide how much time to spend studying versus doing other activities such as sports or clubs. Studying how important GPA is in determining a graduate's income will enable students to better understand how to manage their time effectively during college. Also, it can help students to decide between taking an easy class to boost GPA and taking a more challenging class to gain more knowledge. Hopefully, the benefits from taking more challenging classes will be greater in the long run.

This paper studies the effect of a student's college GPA, major, and standardized test scores in order to see what is most influential on future income. The answer will help students make crucial decisions so that they have the best opportunity to succeed.

II. Literature Review

Over the course of the past several decades, there have been many studies that have estimated how ability, grades, and major affect income. However, very few papers have studied all of these characteristics together in a single model. All aspects of a student's college experience are linked, so the connection between ability, GPA, and major should be examined. This paper will build off of previous research that has examined the post-graduation income of college students in order to determine what is most important.

Several papers have focused on the importance of college major in determining income. Peter Arcidiacono (2004) studies the reasons for ability sorting across majors and the different returns to various college majors on income. Ability sorting across majors is when some majors attract students of a higher ability, on average, than other majors. In order to test whether ability sorting accounts for the disparity in wages across fields of study, Arcidiacono uses a dynamic model between college choice and major choice. He finds, "Virtually all ability sorting is because of preference for particular majors in college." This is an interesting finding, because it shows that students choose their major based primarily on what subject they are interested in rather than what career will pay the most. Perhaps, if students are given more information about the differences in pay across majors, they will choose differently. After controlling for ability, Arcidiacono finds that "large earnings premiums exist for certain majors." This is a very important finding because it shows that the difference in pay across majors is not entirely due to varying ability levels. Clearly, there are other aspects of majors that lead to different salaries.

Dan Scholz (1996) presents theory relating to risk-aversion to explain why certain majors pay more than others. He argues that some majors are riskier than other majors and have greater variance in pay. There are some people who are very risk-averse while others are risk-neutral or even seek risk. People who take on risk must be paid higher average earnings to compensate for the risk they are taking. The cobweb model is used to explain why more technical fields are riskier. Since technical fields require specific knowledge and skills, the labor supply in these fields is fixed. Thus, changes in the demand for this field will cause much greater changes in income for the workers. Also, shifts in demand seem to be much more pronounced in technical fields, so fields such as engineering are very risky compared to more general fields. Scholz finds that there is a strong relationship between the average income of various majors and their risk level.

A couple of papers have found that some majors pay higher wages due to the types of skills they teach. "There are two different types of training that can occur: *general training* and *specific training*" (Thorson, 2005). Specific training is valuable to a far smaller number of firms than general training, but employees with a more specific education should be paid higher because they are more difficult to substitute for as long as there is not an excess supply of qualified workers. However, general training gives much more labor market mobility and greater freedom in career choice. Thorson finds that majors that give more specific skills lead to higher pay, which supports the theory. Thomas and Liang (2005) also find that specific job skills lead to higher pay and help a person advance further in the workplace. They find that more specific jobs also lead to higher percent wage growth for the first four years after graduation. General training leads to lower pay, but these workers are rewarded with greater mobility and can perhaps develop more specific skills once they enter a desired career.

Extensive research has also been completed studying the impact of GPA on future income. Chia and Miller (2008) use data from the University of Melbourne in Australia in order to study the effect of college performance. They find that "the main determinant of graduates' starting salaries is the weighted average mark (equivalent to GPA) they achieve at university." Since the labor market in Australia is comparable to that in the U.S., this suggests that employers use college performance as a key factor in determining who to hire. College graduates typically have little or no full-time work experience and are therefore judged by what they achieve in school. This means that employers use grades in order to screen job applicants. Thus, applicants who have better grades in college will have the highest salaries regardless of their true potential in the workplace. Chia and Miller found that test scores and college major were significant, but not as important as college performance in determining income after graduation.

David Wise (1975) studies whether the skills that lead to success in school also lead to higher productivity. This paper greatly emphasizes the human capital theory. Those with the greatest set of skills will be the most productive, advance in the workplace, and earn the most money. Wise finds that college performance is related to future income, but non-academic characteristics are also important. Skills such as leadership and interpersonal skills are not measured by GPA, but are a vital element of human capital. The study finds that college performance can increase income, but the results are not nearly as strong as the results from Chia and Miller (2008). This suggests that, in the long run, human capital theory is much more relevant than the screening theory previously discussed.

There is support for the screening and human capital theories in Thomas (2000) and Smart (1988) as well. Both studies find that college performance lead to higher earnings after graduation. Thomas studies the effects immediately after graduation, which lends support to the screening theory and agrees with the results of Chia and Miller (2008). Smart includes variables, such as playing a sport and joining a Greek organization, which measure aspects of a student's college experience other than grades and choice of

major. The results support Wise (1975) by finding that both GPA and other college experiences affect income. Smart and Wise both studied earnings more than ten years after graduation, so it is most likely that human capital, not the screening process of employers, accounts for the higher income. This shows that there are non-academic skills that are vital to performance in the workplace and also that grades are some measure of a person's human capital.

Barry Gerhart (1988) uses data from a specific firm in order to study the effect of college performance as well as college major in determining salary differences between genders. Gerhart finds that "college major explains most of the difference in salaries between men and women." This result is interesting, because it suggests that personal preferences account for a large portion of the different earnings across majors. Based on the theory of compensating wage differentials, careers that are more enjoyable will pay less than those which may be more stressful or demanding (Becker, 1993). Some people may prefer a more demanding job with higher pay, while others may prefer a more pleasurable or rewarding job with lower pay. Personal preferences and occupational differences could explain a large amount of the differences in pay across careers and majors.

Boissiere, Knight, and Sabot (1985) study the impact of reasoning skills on income. They use data from Kenya and Tanzania and find that "cognitive skills are the most important form of human capital." Cognitive skills are essentially the ability to learn and acquire knowledge. This means that people who have greater natural ability will be able to gain more human capital and eventually be much more productive. This suggests that it is very important to have some measure of natural ability or thinking skills when studying factors affecting income. Although the SAT has been shown to be affected by human capital acquired through education, it is the best available measure for natural ability. Therefore, test scores will be considered very important in this paper, along with college major and GPA.

By combining the theory from these papers I should be able to develop a strong theoretical framework for my paper. As a whole, the previous research strongly supports that grades, natural ability, and choice of major greatly affect post-graduate earnings for college students.

III. Theoretical Framework

The theory in this paper will build off of the previous literature and commonly used economic ideas. A student's natural ability, GPA, and major should all affect income in different ways. A student's natural ability, or aptitude, should enhance workplace performance and enable the student to move upward. Higher ability or skills should lead to increased production and higher incomes. Also, higher ability will enable a person to acquire human capital more quickly once they enter a certain profession (Boissiere, 1985). Therefore, the worker's production will be further increased, which will lead to even higher incomes. This is a cyclical process that will enable the brightest workers to earn significantly more than those with lower abilities.

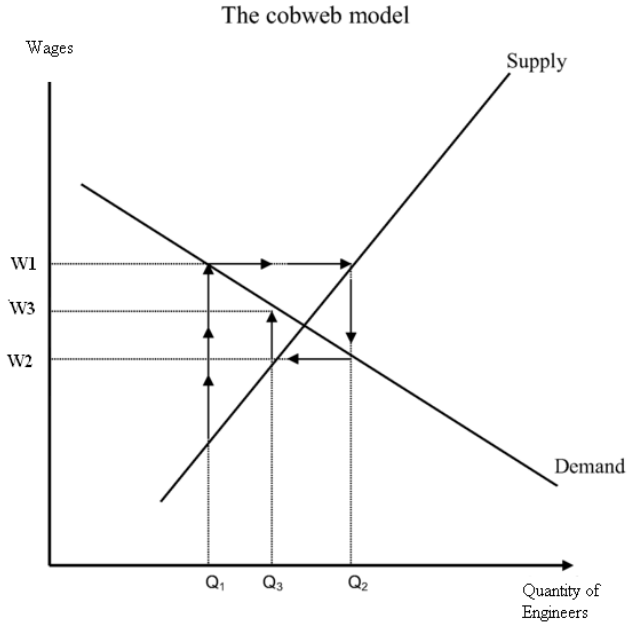
A student's GPA should positively affect income as well. This is supported by the screening theory as well as the human capital theory. The screening theory argues that employers decide who to hire largely based on college GPA. This is because students typically have very limited work experience when they graduate, so grades are the best measure of an applicant's potential productivity (Chia and Miller, 2008). Therefore, students with better grades will be offered better jobs coming out of college and will earn more money. Based on human capital theory, I argue that GPA is a measure of a student's acquired skills and knowledge. Students with better grades will have acquired more knowledge and human capital, so they will perform better in the workplace. This increased performance will allow them to move ahead quickly and earn more money. Immediately after graduation, the screening theory is probably most relevant to income. However, in the long-run human capital should have a much stronger effect, because employers will pay employees based on productivity, which is determined by their human capital. Therefore, by studying earnings immediately after graduation, one can attempt to measure the screening affect. By studying earnings many years after graduation, the human capital affect of GPA can be theoretically measured if other investments in human capital acquired after graduation are controlled for.

There are several theories that explain why certain majors are higher paying than others. Some argue that certain majors pay better because they are riskier (Scholz, 1996). This is because those who are willing to take on more risk must be paid a premium to compensate. Also, it is possible that certain majors, such as medical or engineering fields, attract better students because they are more challenging and harder to gain acceptance into. Therefore, these majors will have higher average salaries due to the fact that students have higher abilities.

Also, certain majors, such as engineering or computer science, give more specific training and this makes these graduates more desirable (Thorson, 2005).

This is based on the cobweb theory, which shows that the supply of labor for specific jobs reacts very slowly in comparison to the labor demand in these markets. For example, the supply of engineers is based on the number of engineering students in college and current engineers. Therefore, the number of engineers is essentially set for the next four years. If there is a sudden increase in demand for engineers, there will be a shortage of engineers, so they will receive much higher salaries. This will cause many more people to become engineering majors, but it will take years for this to affect the supply of labor in the market and lower engineering wages. By that time, the demand for engineers is likely to have changed again, which will once again affect salaries. The job-specific markets can change rapidly, which leads to higher pay for individuals with those skills, but as a return for risk taking. This is illustrated by Figure 1, which shows how the supply of engineers can lead to large fluctuations in the wage level. Although the wage level may be lower at times for specific fields, the average wages must be higher to compensate for the risk.

Figure 1



In addition, compensating wage differentials may explain a large portion of the disparity in wages across majors. Some majors may lead to more pleasurable or less demanding occupations than other majors. Some workers favor jobs that are more enjoyable and are willing to accept less salary. Other people prefer a job that is more demanding, provided that they are paid more. Therefore, the theory of compensating wage differentials suggests that more demanding or stressful occupations will have higher incomes than occupations which are more enjoyable or have better benefits (Becker, 1993). An example is a teacher that accepts a lower salary, because she does not have to work during the summer and enjoys working with children. In summary, some majors may lead to higher incomes, because they lead to more demanding or stressful occupations.

My research hypothesis is that higher natural ability, measured by test scores, higher GPA, and certain college majors will all lead to significantly higher post-graduate income.

IV. Data and Empirical Model

The data come from the National Longitudinal Study of Youth (NLSY), which started in 1997. It contains variables such as college major, college GPA, SAT scores, and income. The NLSY also gives controls for race, gender, age, work experience, and highest grade completed.

The data for income, age, work experience, highest SAT scores, and highest grade completed come from the 2006 survey, which is the most recent data available. The GPA variable uses data collected from all the survey years and averaged in order to measure the cumulative college GPA of each student. The GPA variable was only computed for students who were graded on a 4.0 scale. The variable is only for college classes and takes into consideration every class they took. If a student attended more than one college, the GPA combines the classes from all the schools they attended. Most of the respondents were around 26 years old in 2006, so they had graduated four or five years earlier, on average. The study also includes some respondents who did not complete their degree or went on to graduate school.

In order to measure the effect of college major, dummy variables were created for each of the 20 most common college major choices in the data set. For example, if a student is an engineering major, then a 1 is entered as the value for engineering for the student. If the student is not an engineering major, then a 0 is entered. The most recent response for choice of major was used to create the college major variable. If a student last reported a major in 2004 then the major reported in that year was used. Dummy variables were also created for race and gender. Age is the person's age at the time of the 2006 survey. Work experience is the number of years of full-time work the person had completed by 2006. The GPA variable is only computed for students who were graded on a 4.0 scale and it is their cumulative GPA. Table 1 summarizes the important variables in the data and shows whether each major can be

associated with incomes, GPA's, or test scores that are above or below average.

Table 1: Comparison of Average Income, Average GPA, and Average SAT Scores for Each Major

Major	Average Income	Average GPA	Average Math	Average Verbal	Sample Size
Architecture	$17,113	3.099	533.33	518.52	30
Biology	$16,692	3.171	567.55	554.79	113
Business	$23,733	3.054	537.62	520.03	459
Communications	$19,612	3.057	529.08	535.20	133
Computer Science	$24,623	3.015	571.51	537.79	152
Criminology	$21,170	2.992	448.68	477.63	96
Economics	$22,533	3.133	629.41	588.24	32
Education	$17,817	3.101	493.50	500.00	218
Engineering	$25,139	3.179	595.83	553.13	152
English	$17,352	3.222	562.96	609.26	62
Art	$17,969	3.183	564.10	576.92	127
History	$20,648	3.232	552.78	616.67	47
Home Economics	$16,245	2.898	363.81	380.47	33
Math	$19,541	3.274	622.73	559.09	33
Nursing	$19,502	3.140	531.75	522.22	129
Health	$20,640	3.106	535.96	530.70	121
Physics	$19,375	3.077	571.88	550.00	40
Political Science	$18,605	3.160	573.68	580.77	63
Psychology	$17,167	3.200	554.08	579.59	141
Sociology	$17,480	2.967	486.59	508.54	62
Total	$19,531	3.086	541.32	539.98	3479

Table 1 shows that the average income, GPA, and test scores vary across majors. The major with the lowest average income is home economics, which is about $3,300 below the total average. Engineering majors earn the most and have an average income more than $5,500 above the overall average. This appears to be a very significant difference. The highest average GPA belongs to math and the lowest belongs to home economics. No major has an average GPA that differs from the total average by more than .19. This suggests that the GPA's are fairly similar across majors. The average SAT scores range from 363 to 629 so there are clearly different ability levels across majors. This shows that it is very important to include SAT scores in the empirical model. The data show that ability varies more between majors than GPA, which suggests that grades are somewhat normalized within disciplines. Hence, some majors may be more competitive or challenging than others.

Table 1 gives some other very interesting statistics. Psychology is above average when it comes to GPA, SAT math, and SAT verbal scores, but shows a total income of more than $2,300 below average. This suggests that the major may be causing the lower incomes. Business on the other hand, has below average GPA, math, and verbal statistics, but its average income is the third highest. Perhaps, choosing business as a major leads to a higher income. Comparing math to engineering gives similar results. Math majors have better grades and test scores than engineering majors, but they have far lower incomes. The regression will test whether these high paying majors are truly better investments or if there are other causes for the disparity in income.

The empirical model will use an ordinary least squares regression to test the research hypothesis. The model will be in the form of a linear regression:

Income = a + ß1(GPA) + ß2(Major) + ß3(SAT Math) + ß4(SAT Verbal) + ß5(Work Exp) + ß6(Race) + ß7(Female) + ß8(Age) + ß9(Highest Grade Completed) + u

Using a linear regression will make it possible to estimate exactly how much each variable affects income. For example, the coefficient for each major will predict exactly how much annual income will be gained or lost simply by choosing that major. The coefficient for GPA will predict how much additional income is created from a one point increase in GPA and the coefficient for SAT math and verbal will estimate the increase in annual income from a one point improvement in the respective test score. Linear models have been used in several previous papers done on the subject and have been quite successful. (Gerhart 1988; Rumberger 1993; Scholz 1996)

Variables and their expected signs:

Income (Dependent): Income will be measured as the total income each respondent earned through their own wages and salary during 2006. It includes all respondents that earned at least $5,000 during the year. Thus it includes those that may have worked part-time or only for a few months during the year.

College major (+/-): Some majors should lead to higher pay, such as engineering and computer science, while other majors should be associated with lower salaries. A series of dummy variables was created, one for each major studied. For each respondent, a 1 denotes the student reported that major, a 0 denotes they did not study under that major.

College GPA (+): A higher GPA should lead to higher starting salaries and better workplace performance, which will lead to even higher salaries. This variable was cumulative and measured on a 4 point scale.

SAT Math (+): A higher SAT Math score indicates stronger math abilities, which should lead to increased productivity and higher income. The scores range from 200-800, with 800 being the highest possible score.

SAT Verbal (+) : Better verbal skills should also lead to better work performance, but results from the literature show that verbal skills are not as important as math skills. The scores range from 200 to 800.

Gender (+/-): Previous research has often found that men do make more money than women. Some reasons are differences in work experience, hours worked, and possible gender discrimination. A 1 denotes a female in the data and a 0 denotes a male.

Race (+/-): Earnings may also be affected by race, because of differences in experience and possible discrimination. This is also a series of dummy variables. The groups included are Black, Native American, Asian, and Hispanic. White people are the excluded group. A 1 is used to describe the person of that race, whereas a 0 means they are not of the respective race.

Age (+) : Income should increase with age as a person gains knowledge and experience as well as the opportunity to advance in the workplace, but human capital theory suggests that it will increase at a decreasing rate. However, since this paper uses employees who are very close in age, the effect should be nearly linear. This variable is measured in years at the time of the survey.

Highest Grade Completed (+) : Greater amounts of education should lead to higher levels of human capital and better job opportunities, which should create higher levels of income. This is measured in terms of the number of years of education.

Work Experience (+): Experience allows a person to develop additional skills, which should increase productivity and income. This is measured in years of work experience.

V. Results

The results of the regression were very significant. As a whole, the empirical model is significant at the .001 level and has an R-squared of .354, which is strong for a regression in labor economics. The regression had many significant variables with the expected signs. All of the dummy variables for race were insignificant and the variable for years of education was also highly insignificant. These variables were removed from the model and a second regression was run. The results for the second regression were also strong.

College Major Variables: The results of the first regression found that six of the majors significantly impact income. Business, Communications, Computer Science, Engineering, and Nursing majors all had significant positive effects on post-graduate income, with Business and Engineering being the most significant. The only major that had a significant negative effect on income was Psychology. The other fourteen college majors were not found to have a statistically significant impact on income. The results for the second regression were similar, but Biology and Art became significant and had a negative impact on income. In the second regression Computer Science and Nursing became more significant and still had a positive effect on income. In the second regression, eight college majors were found to significantly impact earnings. This supports the idea that the choice of major is important in determining how much money a student will earn after graduation.

Table 2: Regression Results

	Regression 1		Regression 2	
Variable	Coefficient	T-Statistic	Coefficient	T-Statistic
Architecture	-1049.9	-.313	-1133.6	-.342
Biology	-2519.35	-1.370	-2585.45	-1.719*
Business	4252.7	3.337***	4189.2	3.305***
Communications	2624.2	1.735*	2428.7	1.739*
Computer Science	3754.3	1.943*	3727.7	2.033**
Criminology	2110.0	.778	2023.2	.748
Economics	-1902.1	-.636	-1809.2	-.610
Education	-1437.7	-.846	-1509.7	-.894
Engineering	6505.1	3.357***	6559.5	3.399***
English	-1234.3	-.542	-1294.8	-.572
Art	-2991.1	-1.542	-3022.4	-1.765*
History	-2869.4	-1.075	-2758.3	-1.054
Home Economics	-1891.9	-.444	-1909.6	-.449
Math	-985.5	-.287	-989.1	-.289
Nursing	4129.6	1.781*	4066.1	1.964**
Health	1967.1	.875	1914.0	.853
Physics	2051.4	.707	2163.3	.749
Political Science	2139.5	.939	2051.6	.903
Psychology	-2575.7	-1.841*	-2722.7	-1.837*
Sociology	-1049.8	-.400	-1142.3	-.438
GPA	2873.0	3.309***	2907.1	3.422***
SAT Math	10.878	2.387**	10.035	2.199**
SAT Verbal	3.614	.754	3.457	.728
Female	-1594.5	-1.961**	-991.68	-1.954*
Black	-556.4	-.551		
Native American	1061.7	.159		
Asian	1569.1	.804		
Hispanic	972.2	.748		
Work Experience	4107.4	15.316***	4104.2	15.633***
Years Education	-81.39	-.269		
Age	1307.1	3.697***	1298.1	3.867***
R	.609		.592	
R-squared	.370		.350	
Adj. R-squared	.354		.337	
F-Statistic	21.424		25.555	

*Indicates Significance at the .10 level
**Indicates Significance at the .05 level
***Indicates Significance at the .01 level

The coefficient for each major can be interpreted as the amount of annual income that is gained or lost by choosing that major compared to the omitted group, which is those who did not report a major and those who reported less common majors. For example, the coefficient for engineering is approximately 6,500 in each regression, so that means that being an engineering major will increase one's income by about $6,500 every year compared to the omitted group. That is a lot of extra money to earn every year after college. Interpreting the other coefficients finds that business majors make approximately $4,250 more, nursing majors make about $4,100 more, and computer science majors make over $3,700 more every year by choosing their respective field. If these wage gaps across majors stay the same over time, during the next 20 years an engineering major will make an extra $130,000 simply because they chose engineering. However, in present value terms the amount is smaller.

On the other hand, majors such as psychology lead to significantly lower income. A psychology major sacrifices around $2,500 every year by choosing that field. When compared to an engineering major, a psychology major of equal ability will earn about $9,000 less every year. Art majors, history majors, and biology majors also had similar levels of earnings to psychology majors. This implies that when a student chooses a major such as psychology, either they are unaware of the lower expected income associated with the field or they are willing to sacrifice that amount of income in order to still work in the field. Therefore, the difference in wages across majors is likely due to either compensating wage differentials or a lack of information given to college students. Since the data

comes from students who recently graduated college, it is not guaranteed that the each major will have the same impact on income later in a person's career. It is possible that a major such as psychology will pay less initially, but will lead to greater opportunities to move ahead or find better jobs further down the road.

GPA Variable: The results show that college GPA is a very significant determinant of income. The GPA coefficient was significant at the .01 level. Also, the coefficient was about 2,900 in each model, which means that a one point increase in GPA will lead to around $2,900 more in salary every year. Clearly, working hard in school pays. An "A" student will make approximately $2,900 more than a "B" student and $5,800 more than a "C" student every year. These results come from workers who recently graduated, so this most strongly supports the screening theory. Employers use grades as a tool to judge applicants, so students with higher GPA's are likely to get better jobs. In order to better estimate the human capital effect of a higher GPA, a data set consisting of college graduates many years after graduating would be more appropriate.

SAT Variables: The results for the math and verbal variables were very interesting. The SAT math variable was very significant in both regressions, but the SAT verbal variable was very insignificant. This supports the previous research. It implies that math ability is much more important than verbal or linguistic skills in most occupations. The results also suggest that math ability is more directly linked to acquiring human capital than verbal ability. The coefficient for the SAT math variable is slightly above 10 in each regression. This means that a student who scores a 700 on the SAT math will make over than $2,000 more each year on average than someone who scores a 500. It is possible that this difference will grow, because those with higher abilities will be able to gain human capital at a faster rate throughout their careers. Therefore, they will become even more productive than those with less natural ability and the wage difference will grow. This could be tested by studying data consisting of workers older than the ones used in this paper.

Control Variables: In the first regression the female, age, and work experience variables were all very significant. The race variables as well as years of education were found to be insignificant and were not included in the second regression. It is promising that the race variables were insignificant, because it implies that there is not significant discrimination and that there are similar opportunities for everyone. The years of education variable was expected to have a positive impact on income, but it was found to have an insignificant negative impact. An explanation for this could be that those who went on to graduate school have more years of education, but may work less because they are still going to school. These graduate students may earn less now, but will most likely earn more than those with less education in the future. This could be somewhat controlled for by only using those who work full-time all year, but this would not be possible with the data. A control for this in future studies may affect the results.

The female variable was significant in both regressions, but the coefficient decreased from 1,594 in the first model to 991 in the second model. The results suggest that women earn less than men even after controlling for major and ability. This could be due to sexism in the workplace or labor force participation. Women may choose to work less than men, because they want to have children and start a family. Therefore, they will earn less money. This may explain why women were found to make about $1,000 less than men.

The age and work experience variables were both highly significant and positively affected income. Work experience was the most significant variable with a t-statistic of 15.633. The coefficient implies that income increases by more than $4,000 with every additional year of work experience. Also, age increases income by an additional $1,300 every year. These variables both have a very significant impact on earnings shortly after graduation, but will most likely have a diminishing effect in the long-run. For the first few years after graduation, an individual's income will be expected to rise by about $5,300 every year with about $4,000 coming from an additional year of experience and $1,300 from an extra year of age.

VI. Conclusion

The results of this paper showed that grades, math ability, and choice of major are all very important. Students should work hard in school, learn math, and consider income when choosing a major. Since having a higher GPA leads to higher levels of income immediately after graduation, students may benefit financially from taking easier classes in order to get better grades. This is because employers often use GPA as part of the screening process for employees. However, taking more challenging classes may help a student develop more human capital which would increase productivity. Thus, in the long run there may be benefits to taking more challenging courses. In order to find whether the human capital effect in the long run is stronger than the screening effect of GPA in the short run, it would be useful to run similar regressions using data with older employees. If GPA positively impacts income long after graduation, then

it is a fair measure of human capital. If the impact of GPA diminishes in the long-run, then human capital is most likely unaffected by GPA, so employers should not weight GPA heavily when hiring employees.

The results showed that math ability is more important in increasing productivity than verbal ability. This means that students should consider spending more time developing their math and problem solving skills. By improving math ability, a student can make significantly more money. The results also suggest that math courses should be more strongly emphasized in school. By increasing the math and problem solving skills of our society, it is possible we will become more productive. Math and science leads to most new technology, which is vital in enabling our economy to continue to grow.

This paper has found that some majors pay better than others even after controlling for ability. The results also showed the wage differentials between the various majors. This information is very useful for college students. Many college students choose their major without knowing the effect each major has on income. This paper will enable students to make more informed decisions when deciding what they want to study. The results suggest that if students have no preference for occupation, they should choose the highest paying major, engineering. If students have personal preferences for certain majors or occupations, then they must decide how much income they are willing to sacrifice in order to enter their preferred field. Also, since the earnings from each major vary greatly, a student must consider the risk involved with each major as well as whether or not they believe they will be successful in a field. A student will not necessarily earn more in highest paying field based on these regressions. Someone who struggles with math, for example, most likely should not choose math as a major even if it pays higher on average. A student can compare the amount of earnings they will forgo to the wage differential and risk for each major in order to make the optimal decision. Students must keep in mind both the salary associated with each major as well as the demands of the occupations associated with it. Hopefully, students will use these results to choose the right major.

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