CONTEMPORARY ECONOMIC POLICY

IS IT WHERE YOU GO OR WHAT YOU STUDY? THE RELATIVE INFLUENCE OF COLLEGE SELECTIVITY AND COLLEGE MAJOR ON EARNINGS

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All college students must decide where to attend college and what major to study. We estimate how earnings by college major differ at different college selectivity types. We find major-specific earnings vary markedly by college selectivity, with the strongest differences among business majors and the weakest differences among science majors. We also find that when comparing earnings of graduates from top colleges to middle or bottom ranked colleges, the distribution of students across majors can be as important as earnings differences by major in accounting for college selectivity earnings gaps. (*JEL* I2, J3)

I. INTRODUCTION

Two of the most important decisions faced by students contemplating postsecondary education are where to attend college and what major to choose. The outcomes associated with these decisions are of great interest to the public, and receive abundant attention in the media and policy reports. For example a recent report by the Hamilton Project at the Brookings Institution reported the lifetime earnings of approximately 80 college majors. The annual U.S. News and World Report rankings which rate colleges according to a number of dimensions captivate college-going students and higher education institutions alike. The *New York Times* has reported on whether the benefits of attending an elite college are worth the cost.[1]

The respective research literatures on college selectivity and college major have each demonstrated that where you go to school and what you study are related to future earnings. In general, the college selectivity literature has shown that attendance at more selective colleges is associated with higher labor market earnings.[2] For example, Hoekstra (2009) finds that attending the most selective state university leads to earnings that are about 20% higher for White men. Brewer, Eide, and Ehrenberg (1999) find that the average earnings from attending an elite private university are nearly 40% higher compared to a less selective public university, even after controlling for selection into different college selectivity types and expected net costs of attendance. Dale and Krueger (2002, 2011) find a positive earnings premium for students attending more selective colleges, but only for Black and Hispanic students, and students from households with less-educated parents.[3]

Studies focusing on college major have found substantial variation in earnings by major. Arcidiacono (2004) estimates a dynamic model of college and major choice, and finds that even after controlling for selection, large earnings

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1. "Is Going to an Elite College Worth the Cost?" Jacques Steinberg, *New York Times*, December 17, 2010.

2. Many authors use the terms "selectivity" and "quality" synonymously. We have chosen to use the former. Other studies examining returns to college quality or selectivity include: Daniel, Black, and Smith (1996), Behrman, Rosenzweig, and Taubman (1996), Hoxby and Long (1999), Loury and Garman (1995), James et al. (1989), Long (2008, 2010), Black and Smith (2004), Zhang (2005).

3. In related work, Cohodes and Goodman (2014) find that students who accepted a scholarship to attend a lower quality in-state public college when they had the opportunity to attend a higher quality college experienced lower college completion rates.

ABBREVIATION

B&B: Baccalaureate and Beyond

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premiums exist for some majors. In general, studies have found that more-technical fields receive a higher earnings premium compared to less-technical fields (e.g., Grogger and Eide 1995; James et al. 1989; Loury and Garman 1995). Grogger and Eide (1995) find that several years after college graduation, engineering majors earned hourly wages that were on average about 27% higher than high school graduates, while education majors had hourly wages about 10% less than high school graduates, on average.

Most studies examine college major and college selectivity separately, but we are interested in how the combination of college major and college selectivity are correlated with earnings.[4] Why should the *interaction* of college selectivity and college major matter? With all the attention paid to the earnings premium associated with attendance at the most selective colleges, students who cannot afford to attend the most prestigious colleges and those who are unable to gain admittance may perceive themselves to be at a sizeable disadvantage in the labor market after graduation. However, just because average earnings across all students at more selective colleges are higher, it does not mean the average within all majors is higher.

To help motivate this issue, consider a student who wants to be an engineer. The question of interest is, does it matter, in terms of say future earnings, whether the engineering student attends a top ranked college or a less selective college, or is it simply being an engineer that matters? If, on average, engineers from middle or bottom ranked colleges earn about the same as engineers from top ranked colleges, then the student may be better off choosing to attend the less selective, and less expensive, college.

In this paper we have two objectives. First, we estimate how earnings by college major differ at different selectivity types of colleges.[5] Second, we investigate the relative roles of major-specific earnings and the distribution of college majors at different types of college in accounting for earnings differences by college selectivity type. That is, we ask how much of the earnings premium associated with more selective colleges is due to their graduates in each major earning more than their counterparts at less selective colleges, and how much of the premium is due to a greater proportion of students at selective colleges studying higher paying majors. While our analysis is exploratory rather than causal, it sheds light on how the decisions of where you go to college and what major you study are related to future earnings.

II. DATA

The data are drawn from the Baccalaureate and Beyond (B&B), a longitudinal survey conducted by the U.S. Department of Education. The B&B tracks the experiences of a cohort of college graduates who received the baccalaureate degree during the 1992–1993 academic year and were first interviewed as part of the National Postsecondary Student Aid Study. The base year survey interviewed roughly 10,000 students and collected extensive information on students' postsecondary educational and labor market experiences, including detailed financial aid information. The first follow-up was conducted in April 1994 and collected detailed information on the student's postgraduate education and early post-baccalaureate labor market experiences. The second follow-up took place in April 1997 and collected postgraduate education and labor market information similar to the previous follow-up. The third follow-up was conducted in spring 2003, and yielded responses from about 9,000 individuals. This sampling design makes the B&B ideal for examining the economic returns to college attendance as such studies require information on several different aspects of a student's college experiences, including field of study, college performance, and the institution attended.

The dependent variable in our earnings functions which is used to estimate major-specific returns is the logarithm of annual earnings in 2003. This represents earnings 10 years after college graduation. The independent variables of interest are binary measures for college major, which are collapsed into seven categories: business, engineering, science, social science, humanities, education, and other major. We use these broad aggregated major categories to avoid

4. Thomas and Zhang (2005) study a similar issue of early career wage growth as a function of college major and college quality, although major and quality are treated separately and not interactively.

5. We focus on how observed college selectivity/college major combinations are associated with earnings and not on the process of how a student chooses a particular college selectivity and major combination. See Bettinger (2010) and Arcidiacono, Hotz, and Kang (2012) for research modeling college major choice, and Brewer, Eide, and Ehrenberg (1999) for choice of college selectivity. While we focus on the association between earnings and college selectivity and college major, research has shown that students also value consumption amenities such as spending on student activities, sports, and dormitories (Jacob, McCall, and Stange 2013).

TABLE 1
Summary Statistics by Selectivity Type, 2003 Cross-Section

	Top Selectivity	Middle Selectivity	Bottom Selectivity
2003 Annual Earnings	64,075.46	54,445.37	51,924.86
	(33,704.47)	(29,024.82)	(27,835.76)
Individual Characteristics			
Male	.513	.451	.431
Black	.042	.055	.112
Hispanic	.026	.021	.032
Other Race	.095	.055	.058
Married	.660	.687	.673
Own SAT Score	1,088.12	974.19	919.89
	(181.33)	(175.30)	(191.02)
Family Income	57,852.45	41,732.94	36,093.31
	(60,942.19)	(43,898.48)	(37,821.78)
Age at BA Receipt	23.42	25.48	26.64
	(4.42)	(6.41)	(7.10)
Received Postgraduate Degree	.375	.262	.240
Attending Part Time	.053	.060	.073
Observations	2,507	3,401	1,387

Notes: Standard deviations in parentheses. Missing values not included in the calculation of some means.

small sample sizes associated with more detailed classifications. See Appendix A for information on how the detailed categories are grouped into the broader classifications.

The control variables include continuous measures for age at bachelor's degree graduation in 1993, family income in 1991 (measured in dollars), and the student's SAT score.[6] We also include binary variables for race/ethnicity (Black, Hispanic, other), gender, marital status, completion of a postgraduate degree, part-time school enrollment, and a control for imputation of the SAT score from ACT data. The models also include indicators for missing values of the continuous variables in which case the continuous variable is set to zero for that observation.

In ranking the colleges from which a student received a bachelor's degree we use the rankings provided by *Barron's Profiles of American Colleges* (1993 edition). Barron's ratings are based on selectivity of admissions decisions, such as students' class rank, high school grade point average, average SAT scores, and the percentage of applicants admitted. We divide institutions into three groups based on a rating of most competitive, highly competitive, or very competitive ("top"), competitive ("middle"), and less competitive or non-competitive ("bottom").[7] The selectivity categories are grouped into the three broad categories in such a way that there are sufficiently large cell sizes for the college selectivity/college major combinations used in the analyses. In assigning the Barron's rankings we first identify the student's undergraduate college based on the reported FICE code, then we match this with the Barron's data for that college.[8]

The samples for our earnings models consist of individuals who are working full time (average hours per week at least 30) and are not enrolled in school full time, have annual earnings greater than $20,000 and less than $300,000, and have a valid FICE code with a Barron's ranking. This results in sample sizes of 2,507 for top selectivity, 3,401 for middle selectivity, and 1,387 for bottom selectivity.

Table 1 contains basic summary statistics of the variables used in the analysis. The values of the variables are largely intuitive. By 2003, students graduating from the top colleges have

6. The family income data come from financial aid application information, if available. Otherwise, they come from one of the following sources: the parent interview, the student interview, the Pell file, or student loan file. The SAT score is taken from data supplied by ETS, which administers the SAT, and if those data are unavailable it is taken from records at the student's college, and if either of these methods fail to provide SAT data then student self-reports are used. If an ACT score is available but a SAT score is not, then a SAT score is imputed from the ACT score using the scale provided in Astin (1971).

7. There are 164 colleges in the top category; 314 in the middle category; and 171 in the bottom category. We note that "top" is not the same as what might considered "elite." There are too few students in the sample who attended such schools to separately examine such a narrow category, and hence we rely on the broader category of "top."

8. A FICE code is a six-digit identification code originally created by the Federal Interagency Committee on Education.

TABLE 2
Average Annual Earnings by Major and Selectivity Type, 2003 Cross-Section

	Top Selectivity	Middle Selectivity	Bottom Selectivity	Overall
Business	72,704.88	62,229.69	56,136.24	63,390.44
	(36,253.17)	(34,598.93)	(27,320.69)	(33,951.34)
Observations	231	485	219	935
Engineering	78,900.97	68,500.17	72,225.14	74,271.93
	(28,144.65)	(21,073.60)	(20,840.30)	(25,338.32)
Observations	287	205	71	563
Science	65,432.43	61,645.53	59,227.33	63,024.08
	(35,927.37)	(30,451.40)	(36,344.89)	(33,959.20)
Observations	406	354	129	889
Social Science	63,414.47	53,155.91	49,168.34	57,107.39
	(34,904.28)	(31,011.72)	(28,853.76)	(32,984.77)
Observations	548	505	184	1,237
Humanities	57,056.57	49,831.24	44,562.64	52,042.74
	(30,693.92)	(23,548.67)	(23,553.97)	(27,173.09)
Observations	287	282	109	678
Other Major	61,915.86	54,982.12	54,741.99	56,876.00
	(32,780.40)	(29,083.30)	(29,658.48)	(30,438.48)
Observations	533	944	421	1,898
Education	48,858.99	42,049.48	39,397.44	42,771.33
	(25,577.05)	(19,484.40)	(12,489.36)	(19,777.58)
Observations	215	626	254	1,095

the highest annual earnings ($64,075), followed by middle selectivity ($54,445), and then bottom selectivity ($51,925). Males make up 51% of students in top selectivity colleges, while they are somewhat less represented in middle and bottom selectivity schools. Only 7% of students in top selectivity colleges are Black or Hispanic, while these students are over 14% of bottom selectivity colleges. Between 66 and 69% are married in 2003. The average SAT scores follow the expected pattern, with the highest average scores at top colleges (1088) and lowest average scores at bottom colleges (920). Students from top ranked colleges come from the wealthiest families ($57,852), and students from bottom colleges are from the least affluent families ($36,093). Students from top colleges have an average age in 1993 of 23.42, compared to 25.48 for middle selectivity colleges and 26.64 for bottom selectivity colleges.[9] About 37% of the students from top colleges completed a graduate degree by the 2003 follow-up, compared to about 26% for middle selectivity and 24% for bottom selectivity colleges. Finally, about 5–7% of each college selectivity group is still enrolled in college part time in 2003.

In Table 2 we present the average earnings in 2003 by college major and college selectivity type. For the most part these means are as expected, with students from top colleges having higher average earnings than students in the same major from middle and bottom selectivity colleges. For example, business majors from top colleges have annual earnings of $72,705 compared to about $62,230 and $56,136 for their counterparts in middle and bottom selectivity colleges. The one exception to this pattern is that engineering majors from bottom selectivity colleges have average earnings that are a bit higher than engineers from middle selectivity schools. While our analysis focuses on comparing a given major across selectivity types, as a descriptive exercise we note there is considerable variation in earnings across majors and selectivity types. Graduates with more technical majors of business, engineering, and science have the highest earnings in each college selectivity type. In contrast, the average earnings of an education major from a top selectivity college are the same as the average earnings of social science majors from bottom selectivity colleges, and are lower than the average earnings from all of the other majors except humanities from bottom selectivity colleges.

These simple descriptive statistics suggest considerable variation in earnings according to both college selectivity and college major. That

9. We note that the modal ages are considerably lower than the average ages. For example, the modal age for top selectivity colleges is 22 years. This discrepancy is largely due to the fact that the minimum age is effectively truncated since a student must first complete high school, while there is no maximum graduation age, and so a few older students can pull up the average age considerably.

is, what you study may be as important as where you go.

III. ESTIMATION

To analyze the differences in returns to college major across different college selectivity types we estimate log annual earnings functions. We employ data from the 2003 follow-up and estimate separate regressions for top, middle, and bottom selectivity groups. The equation we estimate separately for each of the three college selectivity types is:

$$y_i = M_i\alpha + X_i\beta + v_i \quad (1)$$

The dependent variable is the logarithm of annual earnings of individual i in a given college selectivity type. The vector M_i contains the college major dummy variables, with education being the excluded college major. Hence, the estimates in α give the earnings premium for a given major relative to education. The vector X_i is composed of the control variables. The error term is v_i which is assumed to have a zero mean.

For each of these three regressions (top, middle, bottom selectivity) we obtain estimates of the earnings premium associated with each of our college majors, relative to an education major. [10] To obtain the predicted log annual earnings for a given major, we then sum the estimated coefficient for that major with the intercept term (setting all other major dummies to zero), where the intercept has been adjusted to represent the log annual earnings of the person with average values of the variables in the overall sample (i.e., setting $X_i = \overline{X}$). After obtaining estimates of the log annual earnings for each major in each college selectivity type we take the difference for a given major across college selectivity types to estimate whether or not there is a premium associated with higher selectivity colleges for each major.

In considering our estimates of the log annual earnings by major across college selectivity types, a natural issue that arises is the potential for our estimates to be affected by selection bias. The selection bias issue we face is complex because selection occurs along two dimensions: college selectivity and college major.[11] Specifically, there are three college selectivity types and seven college majors. Because of the particularly complicated structure of selection bias with 21 possible outcomes, we acknowledge that our estimates are descriptive and not causal. We nevertheless believe that our approach provides a useful step in better understanding how college major and college selectivity are associated with an individual's future earnings.

10. We include a table with all regression coefficients in Appendix B.

11. We also note there could be selection into employment and job sector.

IV. RESULTS

A. *Earnings Functions*

We now turn to the estimation results from our log annual earnings functions. In Table 3 we present differences in predicted log annual earnings, by college major and college selectivity type. Column 1 contains the differences by major in log earnings between top and middle selectivity colleges, and columns 2 and 3 contain the analogous results for the comparisons of top and bottom, and middle and bottom, respectively. These estimated differences suggest whether the earnings for a given major differ across college selectivity type as measured 10 years after bachelor's degree completion.[12]

Among all majors, the field with the most acute earnings differences across college selectivity types is business. Our results show that business graduates from top colleges earn on average more than graduates from middle selectivity colleges, and graduates from middle selectivity earn more than those from bottom selectivity. The coefficient estimates of these differences are also the largest of any major: top selectivity graduates earn 12% more on average than middle selectivity graduates; top selectivity graduates earn about 18% more than bottom selectivity graduates; and middle selectivity graduates earn almost 6% more than bottom selectivity graduates. While we cannot say definitively what the underlying reasons are for significant differences across college selectivity types for business majors, it could be related to differences in alumni networks and other connections with potential employers for jobs and internships due to institutional prestige.

The statistically weakest earnings differences for a given major across college selectivity types

12. To assess how our results may be influenced by differences in the probability of being employed, by major and selectivity, we replicated our analysis using just the sample of males. While there are a few differences in results between the full and male samples, they are relatively minor and the main conclusions remain the same.

TABLE 3
Estimated Difference in Log Annual Earnings, 2003 Cross-Section

	Top–Middle	Top–Bottom	Middle–Bottom
Business	.120**	.179**	.059*
	(.034)	(.040)	(.034)
Engineering	.077*	−.036	−.112**
	(.040)	(.055)	(.056)
Science	−.036	−.010	.025
	(.031)	(.042)	(.041)
Social Science	.105**	.140**	.034
	(.026)	(.036)	(.035)
Humanities	.055	.110**	.055
	(.036)	(.047)	(.045)
Other Major	.046**	.031	−.015
	(.023)	(.028)	(.025)
Education	.061*	.086**	.025
	(.034)	(.040)	(.032)

Notes: Standard errors in parentheses. Regressions also include family income, SAT score, age at BA receipt, and dummy variables indicating sex, race (White omitted), marital status, graduate degree attainment, part-time attendance, SAT score imputed, and whether some observations were missing (in which case the values were set to 0).

*Significant at 10% level; **significant at 5% level.

is found for science majors where there are no statistically significant differences between any of the college selectivity groups. A somewhat similar pattern holds for engineering majors when comparing top selectivity to the other groups. There is only a marginally significant earnings difference between engineering graduates from top and middle selectivity colleges, but no significant difference between engineering majors from top and bottom selectivity colleges. Considering that the broad categories of science and engineering encompass all of the STEM fields, these results suggest that in these more technical fields it may be that the skills a student acquires in these fields are more important than the institution attended. We note that the earnings difference between engineers in middle and bottom selectivity is negative, which reflects the average earnings earlier discussed in Table 2.

For social science and education majors, there is a premium to attending a top selectivity college over either a middle or bottom selectivity college, with the top–bottom difference greater than the top–middle difference. However, there is no statistically significant difference between middle and bottom selectivity colleges in these fields. For humanities, there is a sizeable premium to attending a top over a bottom selectivity college, but not to attending a top over a middle selectivity college.

B. Decomposition of College Selectivity Premium

We can combine the information on major-specific premia in each college selectivity type together with data on the distribution of college majors at each selectivity type to take a closer look at why there is a premium to attending a top college. We ask how much of the premium associated with a top college is due to graduates from each major at a top selectivity college earning more than their counterparts at middle or bottom colleges, and how much is due to more students at top selectivity colleges earning degrees in higher paying majors.

To carry this out, let $p_{jc} (j = 1, \ldots, 7;\ c = 1, 2, 3)$ denote the log earnings for students in selectivity type c who studied field j, and let q_{jc} denote the proportion of college graduates in selectivity type c who studied field j. Let the column vector of major-specific log earnings for selectivity type c be given by $p_c \equiv [p_{1c}, p_{2c}, \ldots, p_{7c}]'$ and similarly define $q_c \equiv [q_{1c}, q_{2c}, \ldots, q_{7c}]'$. We can compute the aggregate log earnings for a given selectivity type $\boldsymbol{p}_1'\boldsymbol{q}_1$ as a weighted average of the major-specific log earnings, where the percentage of students in each major is used as weights.[13] The premium associated with attendance at selectivity type 1 relative to selectivity type 2 (e.g., top relative to middle selectivity) can then be expressed as $(\boldsymbol{p}_1'\boldsymbol{q}_1 - \boldsymbol{p}_2'\boldsymbol{q}_2)$, which can then be decomposed as $\delta_q \equiv p_2' \left(q_1 - q_2\right)$; $\delta_p \equiv (p_1 - p_2)'\, q_2$; and an interaction term $\delta_{pq} \equiv (p_1 - p_2)'\,(q_1 - q_2)$.

We use this decomposition to consider two counterfactuals. First, we ask what the earnings premium would have been for top colleges if the major-specific earnings at top colleges were the same as the earnings for each major in the middle selectivity colleges, but the distribution of students across majors for each selectivity type is equal to the actual distributions. This is given by the quantity δ_q. For example, even if the earnings by major are identical for top and middle selectivity colleges, if a greater percentage of students at top colleges graduate in higher paying fields, then the overall premium for top colleges will be higher. The second counterfactual is to ask how much of the earnings premium for top colleges is due to differences in earnings by major, assuming that the distribution of students across majors is identical to that of middle selectivity colleges.

13. This is the same approach used by Grogger and Eide (1995) to analyze the rise in the aggregate college wage premium.

TABLE 4
College Major Distributions by Selectivity Type, 2003 Cross-Section

	Top Selectivity	Middle Selectivity	Bottom Selectivity
Business	.092	.143	.158
Engineering	.114	.060	.051
Science	.162	.104	.093
Social Science	.219	.148	.133
Humanities	.114	.083	.079
Other Major	.213	.278	.303
Education	.086	.184	.183
Observations	2,507	3,401	1,387

TABLE 5
Percent of Colleges That Offer Particular Majors, by Selectivity Type

	Business	Engineering	Education
Top Selectivity	80.61%	62.42%	76.36%
Middle Selectivity	80.95%	51.11%	82.54%
Bottom Selectivity	83.63%	50.29%	78.95%

This quantity is given by δ_p. We carry out the analogous exercise to compare top selectivity to bottom selectivity, and middle selectivity to bottom selectivity.

The college major distributions that we use in this decomposition are shown in Table 4. Comparing the major distributions across college selectivity type shows disparity in the percentage of students in each major at different college selectivity types. There are considerably more engineering and social science majors at top colleges, somewhat more science and humanities majors at top colleges, and relatively more business, education, and other majors at middle and bottom colleges.

A natural question that arises when considering the major distributions reported in Table 4 is the extent to which these distributions represent student choice or whether they represent differences in which majors are offered at different selectivity types. In Table 5 we present data on the percent of colleges that offer majors in business, engineering, and education, by selectivity type. We examine these three fields because anecdotally they seem the most likely to vary by college selectivity. Table 5 shows that there are fairly modest differences in these major offerings by selectivity type. For business, the percentages are 81% for top and middle selectivity, and 84% for bottom. Differences for engineering majors are more pronounced, although not starkly so, with 62% of top selectivity colleges and just over half of middle and bottom selectivity colleges offering this degree. Somewhat fewer top selectivity colleges than middle or bottom selectivity offer education degrees, with differences ranging from 76% at top selectivity to 82% at middle selectivity. Overall, these differences are fairly minor, and it is likely that most of the distributional differences in college major shown in Table 4 are due to student choice and not whether the degree is offered at a particular selectivity type.

The decomposition results are presented in Table 6. The first column shows the difference in overall earnings between the different selectivity types; the second column shows how much of the overall earnings difference is due to differences in the major distribution, holding fixed major-specific earnings; and the third column shows how much of the overall earnings difference is due to differences in major-specific earnings, holding fixed the major distribution. The interaction term was effectively zero in each case, and we do not present it here. The estimated earnings difference between top and middle selectivity colleges in 2003 (10 years after undergraduate degree) is about .153. Of this difference, .096 (or 63%) is due to differences in the major distributions (i.e., differences in the types of majors that graduates from top and middle colleges receive). The portion of the .153 earnings difference due to differences in major-specific premia (i.e., differences in how much graduates with a given major earn) is .071.[14] Hence, differences between top and middle selectivity types in what students choose to study and differences in the returns to a given major are both important, but major distribution differences play a somewhat greater role. Similar differences are shown for the comparison between top and bottom colleges, in the second row of Table 6. The earnings differential is .200, of which .122 (61%) is due to major distribution differences, and .067 (34%) is due to differences in major-specific earnings. The overall earnings difference between middle and bottom colleges is .063, of which .023 (37%) is accounted for by major distribution differences and .035 (55%) is accounted for by differences in returns to majors. The earnings premium for middle compared to bottom selectivity colleges is much smaller than

14. Note that $\delta_q + \delta_p$ do not quite sum to the full difference in earnings premia because the interaction term δ_{pq} accounts for some of the difference.

TABLE 6
Decomposition of Earnings Difference by Selectivity Type, 2003 Cross-Section

	Difference in College Earnings Premium	δ_q	δ_p
Top−Middle	.153**	.096**	.071**
	(.012)	(.009)	(.013)
Top−Bottom	.200**	.122**	.067**
	(.015)	(.013)	(.021)
Middle−Bottom	.063**	.023**	.035**
	(.014)	(.007)	(.014)

Notes: Standard errors in parentheses. The term δ_q measures how much of the difference is accounted for by major distribution differences; the term δ_p measures how much of the difference is accounted for by major-specific earnings differences. The remaining differences are accounted for by an interaction term that is insignificant in all cases and not reported here.

*Significant at 10% level; **significant at 5% level.

the comparisons involving the top selectivity colleges, and a greater part of the middle to bottom comparison is accounted for by earnings differences rather than major distribution differences.

V. CONCLUSION

Two of the most important questions that students considering postsecondary education must answer are where to attend college and what major to study. In this paper we find that for most of our college major categories graduates from top colleges have higher average earnings than students from the same major who receive degrees from middle and bottom ranked colleges. The strongest differences are among business majors and the weakest differences are among science majors. Both differences in major-specific returns and differences in major distributions across selectivity types are important in accounting for overall earnings differences by selectivity type, but when comparing top colleges to middle or bottom ranked colleges differences in major distribution (i.e., what majors students choose at each type of college) are somewhat more important.

Given a college environment with seemingly ever increasing costs, these findings are informative for students and their parents seeking to better understand the long-run implications of their college choices. To provide further insights into the connection between college selectivity, college major, and further educational and labor market outcomes, there are three related research questions we are pursuing. First, why are earnings differences across selectivity types more pronounced for business than other majors? Possible explanations could include how peer and alumni networks differ by selectivity of college, and differences in learning environment and instruction. Second, why are there not more pronounced differences in earnings across selectivity types for STEM majors? Potential reasons could be more standardized curricula across selectivity types than is found in other majors, perhaps due to accreditation requirements or a more commonly accepted body of knowledge. Finally, what are the relative roles of college selectivity and college major in graduate school admissions and outcomes? For example, is a science major from a selective college more likely to be admitted to a prestigious graduate program than a science major from a less selective school, and if so, what is the difference in probability? The answers to these ongoing research questions will yield further insight beyond labor market earnings into the potential benefits of various fields of study at different college selectivity types.

APPENDIX A

TABLE A1
Classification

Major Classification	Specific B&B Defined Majors
Business	Accounting, Finance, MIS, Business Administration, Business Support, Marketing
Education	Early Childhood, Elementary, Secondary, Special, Physical, Other Education Fields
Engineering	Electrical, Chemical, Civil, Mechanical, Other Engineering Fields, Engineering Technology
Science	Computer Programming, Data Processing, CIS, Biological Sciences, Physical Sciences
Social Science	Anthropology, Economics, Geography, History, Sociology, Political Science, International Relations, Psychology
Humanities	Foreign Languages, Letters, Philosophy, Religious Studies, Design, Speech/Drama, Film Arts, Music, Fine Arts
Other Major	Agriculture, Ethnic Studies, American Civilization, Journalism, Communications, Health Fields, Vocational Fields, Law/Pre-Law, Liberal Studies, Environmental Studies, Biopsychology, Leisure Studies, Basic/Personal Skills, Social Work, Public Administration, Industrial & Commercial Arts

APPENDIX B

TABLE B1
Regression Coefficients for All Models

	Top Selectivity	Middle Selectivity	Bottom Selectivity
Business	.3326**	.2739**	.2397**
	(.0412)	(.0250)	(.0383)
Engineering	.3561**	.3405**	.4775**
	(.0408)	(.0341)	(.0555)
Science	.1539**	.2507**	.2499**
	(.0373)	(.0274)	(.0441)
Social Science	.1592**	.1151**	.1055**
	(.0350)	(.0245)	(.0390)
Humanities	.0737*	.0798**	.0498
	(.0392)	(.0292)	(.0458)
Other Major	.1854**	.2006**	.2399**
	(.0349)	(.0210)	(.0325)
Male	.2096**	.2071**	.1719**
	(.0182)	(.0147)	(.0226)
Black	.0080	.0170	.0036
	(.0440)	(.0310)	(.0356)
Hispanic	.0231	−.0053	.0557
	(.0546)	(.0484)	(.0605)
Other Race	.0736**	.0549*	.1065**
	(.0298)	(.0303)	(.0465)
Age at BA Receipt	−.0011	.0003	.0011
	(.0024)	(.0013)	(.0019)
Married	.0392**	.0561**	.0591**
	(.0183)	(.0150)	(.0229)
Own SAT Score	.0003**	.0001**	.0002**
	(.0001)	(.0000)	(.0001)
Family Income	.0000005**	.0000009**	.0000012**
	(.0000001)	(.0000002)	(.0000003)
Received Postgraduate Degree	.0830**	.0942**	.0993**
	(.0188)	(.0160)	(.0259)
Attending Part Time	−.0850**	−.0717**	.0175
	(.0392)	(.0293)	(.0420)
Impute Own SAT Score	−.1325**	−.0843**	−.1060**
	(.0267)	(.0166)	(.0257)
Own SAT Score Missing	.2345**	.0494	.1232*
	(.0662)	(.0496)	(.0686)
Age at BA Receipt Missing	.0113	−.0050	.0329
	(.0718)	(.0480)	(.0692)
Family Income Missing	.0306	.1284**	−.0274
	(.0628)	(.0541)	(.0956)
R^2	.1707	.1800	.1951
Observations	2,507	3,401	1,387

Notes: Standard errors in parentheses. Regressions also include family income, SAT score, age at BA receipt, and dummy variables indicating sex, race (White omitted), marital status, graduate degree attainment, part-time attendance, SAT score imputed, and whether some observations were missing (in which case the values were set to 0).

*Significant at 10% level; **significant at 5% level.

APPENDIX C

TABLE C1
Examples of Schools in Each Selectivity Category

Examples of Schools in "Top" Category
- Clemson University
- Cornell University
- Georgia Institute of Technology
- Indiana University-Bloomington
- Suny at Albany
- The University of Texas at Austin
- University of California-Berkeley
- University of Colorado at Boulder
- Bates College
- Harvard University

Examples of Schools in "Middle" Category
- Appalachian State
- Bowling Green State University-Main Campus
- California State University-Sacramento
- East Carolina University
- Illinois State University
- Montana State University-Bozeman
- Northern Illinois University
- South Dakota State University
- Suny College at Cortland
- University of South Florida

Examples of Schools in "Bottom" Category
- Black Hills State University
- Central Michigan University
- Jackson State University
- Nicholls State University
- Wright State University
- Abilene Christian University
- Gardner-Webb University
- Youngstown State University
- Southeastern Louisiana University
- Bemidji State University

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