Analyzing the Relationship Between Dominant Major and Median Earnings Within U.S. Universities

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1 Introduction

The return on investment for higher education is an important concern for students and policymakers. This paper addresses the following research question: *Do universities with different dominant majors produce different earnings outcomes for their graduates?* Understanding this relationship can inform both student college choices and institutional policy decisions.

2 Data and Methodology

2.1 Data Source

I worked with data from the U.S. Department of Education's College Scorecard (Most Recent Institution-Level Data, updated April 2023), which provides institution-level information on student demographics, outcomes, and admissions. The sample includes data on approximately 6,000 institutions in the United States.

2.2 Key Variables

My analysis focuses on two key variables:

- **Dominant Major**: The academic major representing the largest percentage of degrees earned at each institution.
- **Median Earnings**: The median earnings of graduates 10 years after initial enrollment.

2.3 Sample Selection

I restricted the sample to predominantly bachelor's-degree granting universities with complete earnings data. I also excluding specialized institutions where a single major represented more than 60% of degrees awarded. This yielded a final sample of roughly 1,500 universities.

3 Results

3.1 Descriptive Statistics

Table 1 shows aggregate median earnings by dominant major. Transportation shows the highest median earnings ($84k), followed by Social Sciences ($73k) and Engineering ($72k). Insitituions focused on Agriculture, Theology, and Liberal Arts have the lowest median earnings at below $45k.

3.2 Main Findings

Figure 1 displays the relationship between dominant major and median earnings. The boxplots provide a more nuanced understanding of patterns between majors. Technical majors have the highest maximum earnings. Business and Health Professions feature small interquartile ranges but yield a high number of outliers.

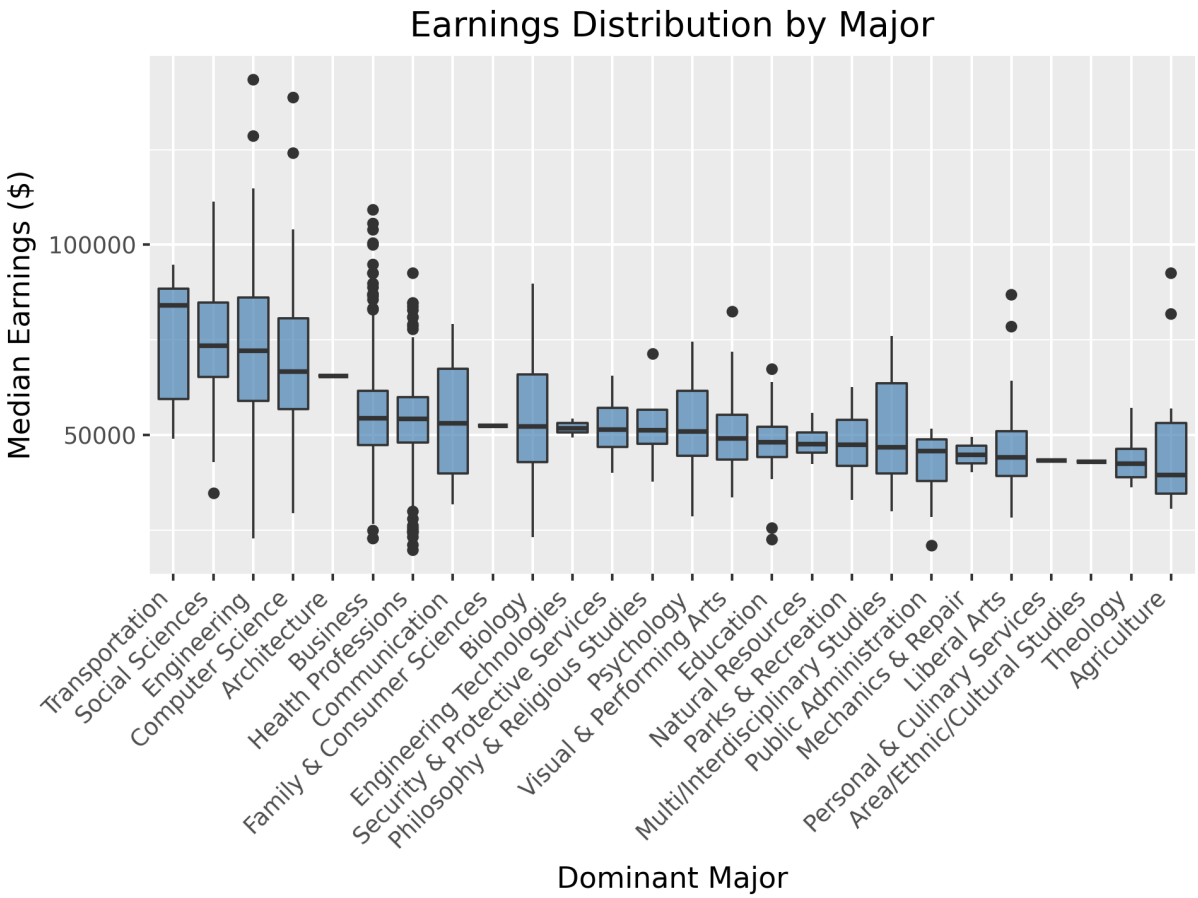

Figure 1: Median Earnings by University and Dominant Major

Figure 2 shows the distribution of the top 50 earning universities, revealing significant within-major variation. This does suggest that institutional quality matters beyond major choice. This also clearly shows the dominance of majors in Technology and Social Sciences.

Figure 2: Top 50 Earning Universities and Their Dominant Majors

4 Discussion

These findings have a few possible implications. First, they suggest that students seeking to maximize post-graduate earnings should not only consider individual major choice, but also the broader academic culture and focus of their institution. Universities with strong Social Science and Engineering programs may provide better career networks, employer relationships, and signaling value even for students in other fields.

Also, the results highlight potential policy concerns about income inequality across different institutions. Students attending Agriculture or Liberal Arts-focused colleges face systematic lower earnings, which may deepen existing disparities in college access.

4.1 Limitations

- First, this analysis examines correlation, not causation. The highest-earning institutions may attract students with greater earning potential regardless of the education provided.
- Also, the earnings measure only grades monetary returns and ignores other student values, such as job satisfaction.
- The 10-year time period does not properly measure long-term earnings, which may drastically differ across fields. For example, many Biology majors are likely completing medical school and residency through their first 10 years after initial enrollment, and do not have their earnings properly reflected in this data.

5 Conclusion

This project demonstrates a relationship between a university's dominant academic major and the median earnings of its graduates. Social Science, Engineering, Computer Science, and Transportation-focused institutions produce graduates earning substantially more than those from Performing Arts or Education-focused schools. These findings confirm the importance of institutional characteristics in determining labor market outcomes and raise important questions about inequality in higher education.

Table 1: Median Earnings by Dominant Major

Dominant Major	Median Earnings	# of Universities
Transportation	$84,131	6
Social Sciences	$73,490	89
Engineering	$72,261	48
Computer Science	$66,757	24
Architecture	$65,668	1
Business	$54,549	648
Health Professions	$54,338	325
Communication	$53,130	4
Family & Consumer Sciences	$52,485	1
Biology	$52,410	67
Engineering Technologies	$51,867	2
Security & Protective Services	$51,590	16
Philosophy & Religious Studies	$51,365	4
Psychology	$51,094	31
Visual & Performing Arts	$49,131	43
Education	$48,136	52
Natural Resources	$47,626	7
Parks & Recreation	$47,590	19
Multi/Interdisciplinary Studies	$46,852	12
Public Administration	$45,868	8
Mechanics & Repair	$44,844	2
Liberal Arts	$44,301	47
Personal & Culinary Services	$43,418	1
Area/Ethnic/Cultural Studies	$43,101	1
Theology	$42,517	24
Agriculture	$39,605	18