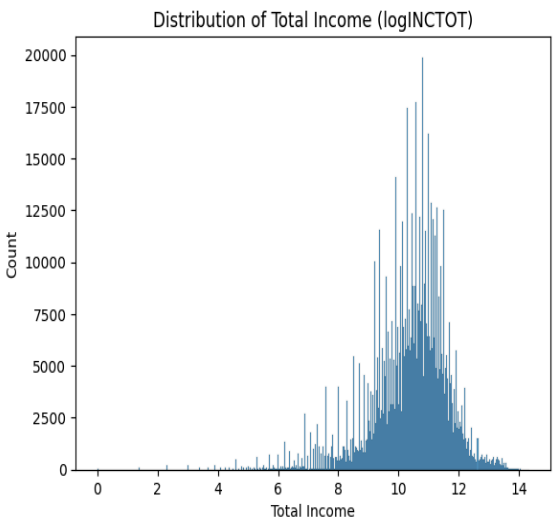
Introduction

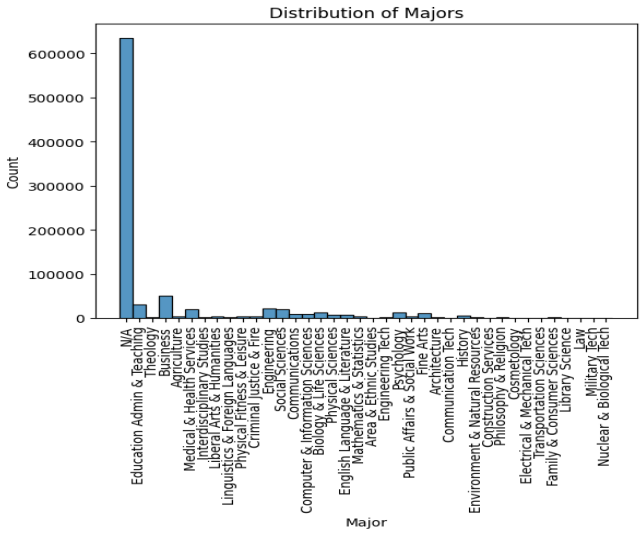
Students are under more pressure to select a college major that will "pay off" after graduation in the current job market. Understanding how various undergraduate majors impact income has become a crucial economic question due to growing concerns about long-term financial stability and rising tuition costs. Since education shapes the types of skills individuals bring into the workforce, certain majors may provide graduates with higher incomes compared to others.

To understand the relationship between major choice and income, we will be testing if undergraduate major significantly affects income after graduation. We expect to see significant differences in income across majors, with fields such as engineering, business, and STEM-related degrees showing higher average earnings. The average salary for majors in the humanities or arts may be lower. Once age is taken into account, however, we also anticipate that this may skew our findings. Our analysis will look at the strength of the relationship and whether the income disparities still exist when basic demographic factors are taken into consideration.

Data

We are using data from IPUMS to look at income and undergraduate majors for people who have completed a bachelor's degree. The main variables in our analysis are total yearly income (INCTOT), age (AGE), years of education (EDUC) and degree field (DEGFIELD). The histogram of income shows that most people earn between the lower and middle income ranges, with a small group earning very high incomes.





The figure on the left displays the distribution of total income after a log transformation. Even in log form, income remains skewed with a long right tail, reflecting significant variation among high earners. The figure on the right shows the distribution of undergraduate majors in our sample. The values on the x-axis represent coded degree fields from IPUMS, and the histogram shows that some majors have far more graduates than others.

Methods

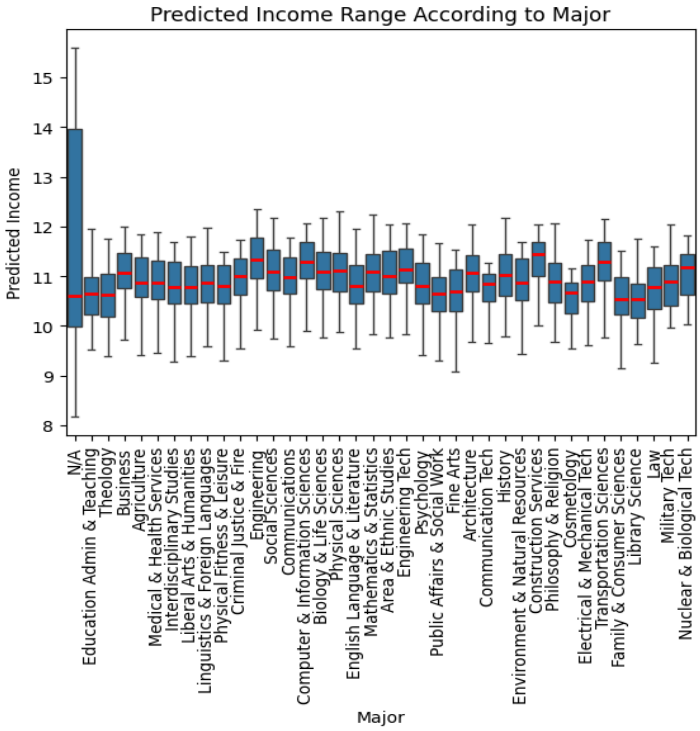
To test if an undergraduate major affects income after graduation, we estimate the following regression model:

Predicted Income = b_0 + b_1*DEGFIELD + B_2*AGE + B_3*EDUC + e

Predicted Income is the dependent variable. AGE controls how earnings usually rise with work experience. EDUC is the years of education that usually impact income linearly. DEGFIELD is included as a set of indicator variables so we can compare the average income of each major to a baseline major. The goal is to see whether changes in major are linked to changes in average income after holding age and years of education constant. This model allows us to measure the relationship between major and income. Because income data is highly skewed and tends to have extreme values, a linear regression may struggle to fully capture large differences across individuals, and the residuals may show signs of heteroskedasticity

Results & Analysis

The regression shows that undergraduate major is strongly related to income. Several majors have positive and statistically meaningful coefficients, suggesting that graduates in those fields tend to earn more than the baseline major. Age is positively related to income, which is expected because people often earn more as they gain experience. The model captures the overall pattern in the data, but there is still variation in income that the model does not explain. This is normal for income data because it tends to vary a lot across individuals.



Conclusion

We analyzed whether undergraduate major affects income after graduation using IPUMS data and a simple regression model. Our results show clear differences in income across majors, even after controlling for age and years of education. Some fields are associated with higher average income, while others are associated with lower income. The model provides some evidence that major choice is strongly linked to income in the data.

Citations

https://www.ipums.org/