The Effects of Family Income and Educational Funding on Graduate Income

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Background

- As private universities become increasingly expensive and numerous states opting for tuition-free public universities, students are at a crossroads trying to find the school that can set them up for success.
  - How can we examine different factors that may influence the “success” (income) of college graduates?
- The US Department of Education’s College Scorecard holds a plethora of data that involves all sorts of variables relevant to our research question, which is:
  - How does institution funding affect median graduate incomes among varying family incomes?

Methods

- Data Cleanup:
  - Limiting college pool to only currently operating schools that are found in the primary 50 states, are non-for-profit institutions, and mainly award bachelor's awards.
  - Converting admission rate, earnings, median family income, and school ownership from ***character*** type to the ***double*** type.
- Exploratory Data Analysis
  - Identifying median earnings of College Graduates
  - Plotting median earnings of graduates to median family income.
  - Comparing median earnings of graduates to median family income across Public and Private institutions.
- Model Building
  - Building a model that uses median income as a outcome variable and funding, median family income, and the interaction term between the two as predictor variables.

Data Makeup

- Sample Size of original dataset = 6806 universities and colleges
    - Total variables of original dataset: 2384 different variables
- Sample Size of Cleaned Dataset = 1800 universities and colleges
    - Total variables of original dataset: 6 variables
        - School Name, Institution Funding, Admission Rate, Cost of Attendance, Median Family Income, and Median Graduate Earnings.
- College Scorecard was created through surveying graduates on various elements of their university and their income as a means of allowing users to see how factors affect median earnings a year after graduation.

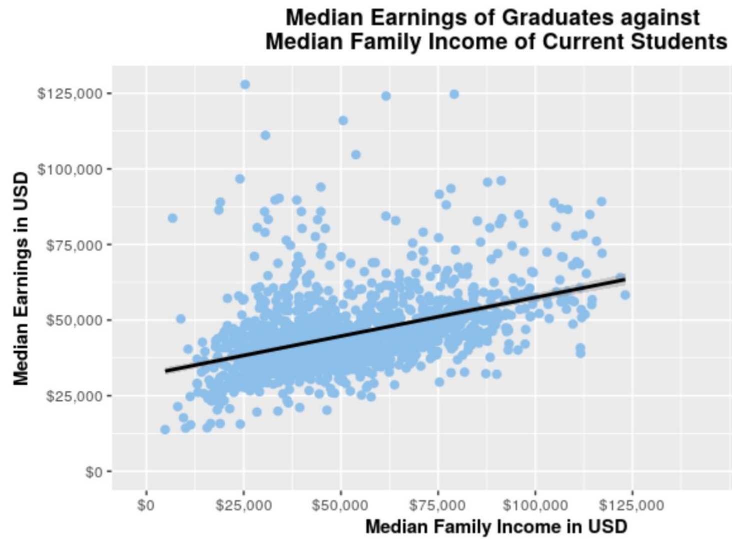
Results

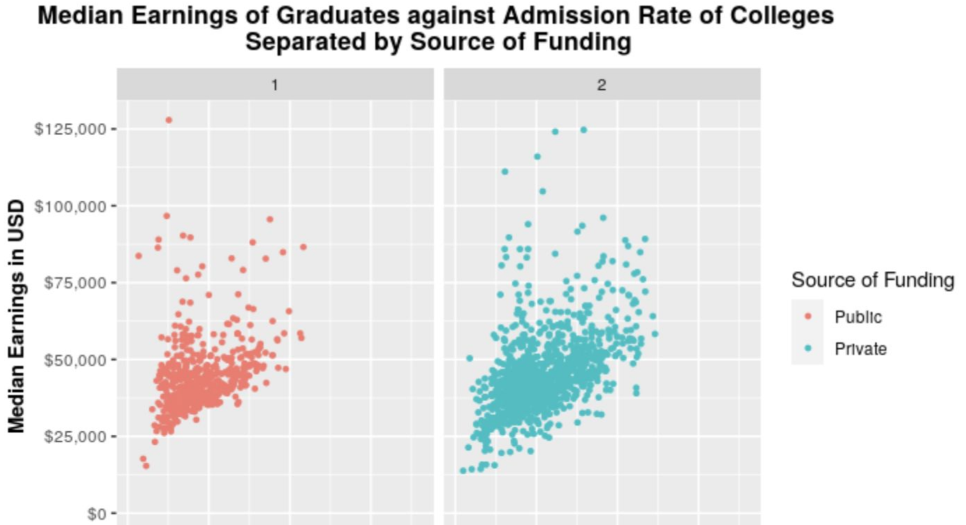
```
Call:
lm(formula = med_earnings ~ med_fam_inc + funding + med_fam_inc *
    funding, data = college)

Residuals:
   Min     1Q Median     3Q    Max
-23079  -6950  -2210   3723  87507

Coefficients:
                     Estimate  Std. Error t value            Pr(>|t|)
(Intercept)       39837.53848  2698.32092  14.764 < 0.0000000000000002 ***
med_fam_inc           0.15287     0.05402   2.830             0.00471 **
funding           -4934.54462  1555.05487  -3.173             0.00154 **
med_fam_inc:funding   0.06348     0.03008   2.111             0.03496 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 11270 on 1594 degrees of freedom
  (202 observations deleted due to missingness)
Multiple R-squared:  0.2027,	Adjusted R-squared:  0.2012
F-statistic: 135.1 on 3 and 1594 DF,  p-value: < 0.00000000000000022
```





Results (contd.)

- Results from our model showed that funding, median family income, and the interaction between the two are statistically significant predictors when trying to forecast median graduate earnings.
- When examining the plot comparing median family income to median graduate earnings, those who have a greater family income typically have greater earnings.
- When examining the plot comparing median family income to median graduate earnings between public and private schools, private schools have a greater median graduate income for upper class students compared to lower income families.

Conclusion

- Key findings
  - It appears that institution funding and family income can have a significant impact on graduate earnings.
  - Private schools tend to provide lower-income students with more success compared to public schools, but both of these types of institutions are more beneficial for upper-class students.
- Limitations
  - About 200 rows were removed because of missing data.
  - Not all students may report key data, especially those who may have not had a good experience at their institution.
  - Median graduate income is only from their first year following graduation, not their lifelong earnings.
- It is important for low-income students to do their research into how various factors at schools can impact their success, and when examining how their economic status affects their post-graduate success, private schools tend to have a greater median income for low-income students compared to public schools.