Analysis of College Admissions

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Motivation/Background

Our focus: college admissions & family income

- 2019 College Admission Scandal: Operation Varsity Blues
- Expensive resources surrounding the college admissions & application process
  - Tutoring
  - Extracurricular activities
  - Private/smaller high schools

Research Questions:

1. Is wealth/income level a factor in the acceptance of students for private universities and colleges?

2. Do selective universities accept a higher/lower percentage of students based on their family's income distribution?

Our Datasets

Cross-sectional Estimates by College (MRC Table 2)

- Estimates of parents' and children's income distributions by college
- Important Variables:
  - Parental mean, parental median, tier, type, ic level, parent in top 1% of income distribution

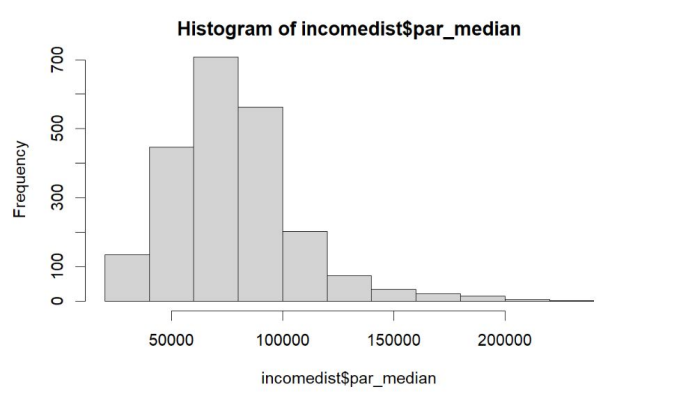
College Level Characteristics (MRC Table 10)

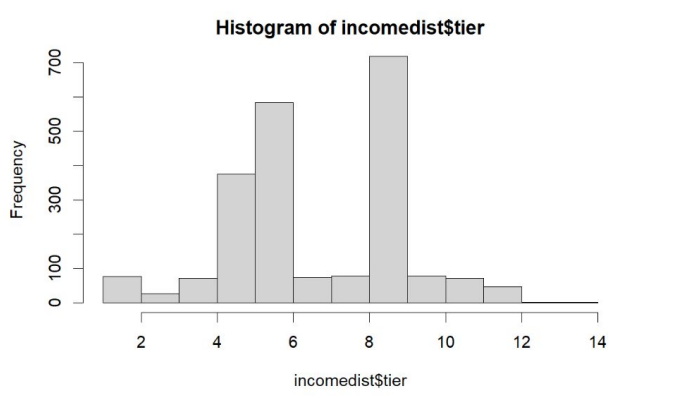
- College characteristics from Dept. of Education IPEDS database in 2000 and 2013 & the College Scorecard
- Important variables:
  - Scorecard rejection rate, stickerprice

Data dictionary

sticker_price_[YEAR]	Average Annual Cost of Attendance (Tuition + Fees) in [YEAR] = 2000, 2013
tier	Selectivity and type combination (see Table 6 for more detailed descriptions of these groups): 1 = Ivy Plus 2 = Other elite schools (public and private) 3 = Highly selective public 4 = Highly selective private 5 = Selective public 6 = Selective private 7 = Nonselective 4-year public 8 = Nonselective 4-year private not-for-profit 9 = Two-year (public and private not-for-profit) 10 = Four-year for-profit 11 = Two-year for-profit 12 = Less than two year schools of any type 13 = Attending college with insufficient data 14 = Not in college between the ages of 19-22
scorecard_rej_rate_2013	Rejection (one minus acceptance) rate in 2013 from College Scorecard

Our Data


Histogram of incomedist$par_median
Frequency
0
100
300
500
700
50000
100000
150000
200000
incomedist$par_median


Histogram of incomedist$tier
Frequency
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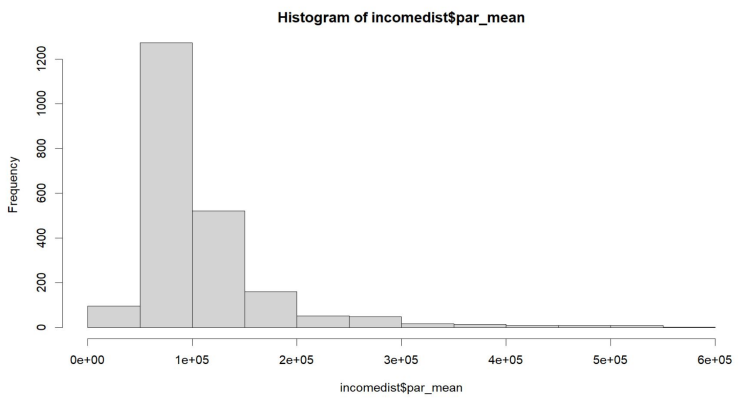
100
300
500
700
2
4
6
8
10
12
14
incomedist$tier


Histogram of incomedist$par_mean
Frequency
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400
600
800
1000
1200
0e+00
1e+05
2e+05
3e+05
4e+05
5e+05
6e+05
incomedist$par_mean

By College Tier

- Independent Variables:
  - Mean income
  - Median income
  - Rejection rate
- Dependent variable: Tier

	meanincomebytier	medianincomebytier	rejectionratebytier
(Intercept)	72905.271+	50500.000**	0.219***
	(42375.445)	(18947.900)	(0.025)
Ivy	358659.988***	124841.667***	0.689***
	(44105.762)	(19721.599)	(0.051)
Elite	236199.888***	103287.500***	0.502***
	(42705.220)	(19095.356)	(0.031)
HighlySelective	140815.198***	71607.216***	0.242***
	(42593.316)	(19045.319)	(0.029)
Selective	39698.673	33648.905+	0.104***
	(42397.533)	(18957.776)	(0.025)
Nonselective	29331.122	22211.111	0.128***
	(42513.702)	(19009.720)	(0.030)
Twoyearorless	550.427	10900.131	0.054
	(42403.169)	(18960.296)	(0.044)
Forprofittier	79.495	5714.667	
	(42516.462)	(19010.955)	
notincollegeby22	-20970.995	-11250.000	

By College Type

- Independent Variables:
  - Mean income
  - Median income
  - Rejection rate
- Dependent variable: Type

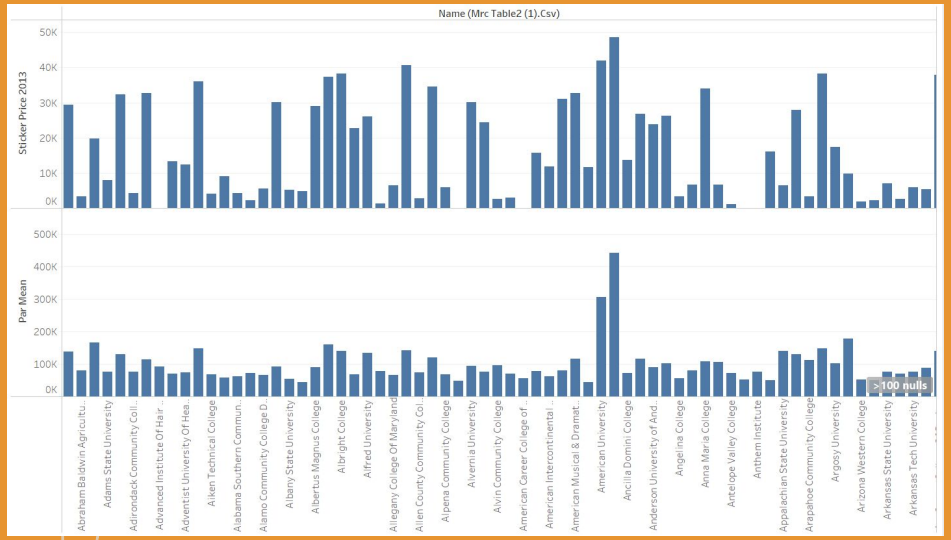
	meanincomebytype	medianincomebytype	rejectionratebytype
(Intercept)	72464.402***	55827.368***	0.214***
	(4306.768)	(1791.774)	(0.030)
public1	12218.921**	13195.489***	0.123***
	(4637.858)	(1929.520)	(0.031)
privatenonprof	76312.431***	39669.579***	0.163***
	(4780.299)	(1988.780)	(0.031)

By IC LEVEL

- Independent Variables:
  - Mean income
  - Median income
  - Rejection rate
- Dependent variable: IC Level

	meanincomebyiclevel	medianincomebyiclevel	rejectionratebyiclevel
(Intercept)	56753.580***	40976.790***	-0.156
	(11850.130)	(4796.353)	(0.198)
fouryear	72209.641***	47375.741***	0.518**
	(11966.977)	(4843.647)	(0.199)
twoyear	5643.562	9331.543*	0.289
	(9367.116)	(3791.351)	(0.193)
Twoyearorless	11398.351	11653.644***	0.156*
	(7613.519)	(3081.580)	(0.066)

Price and Income

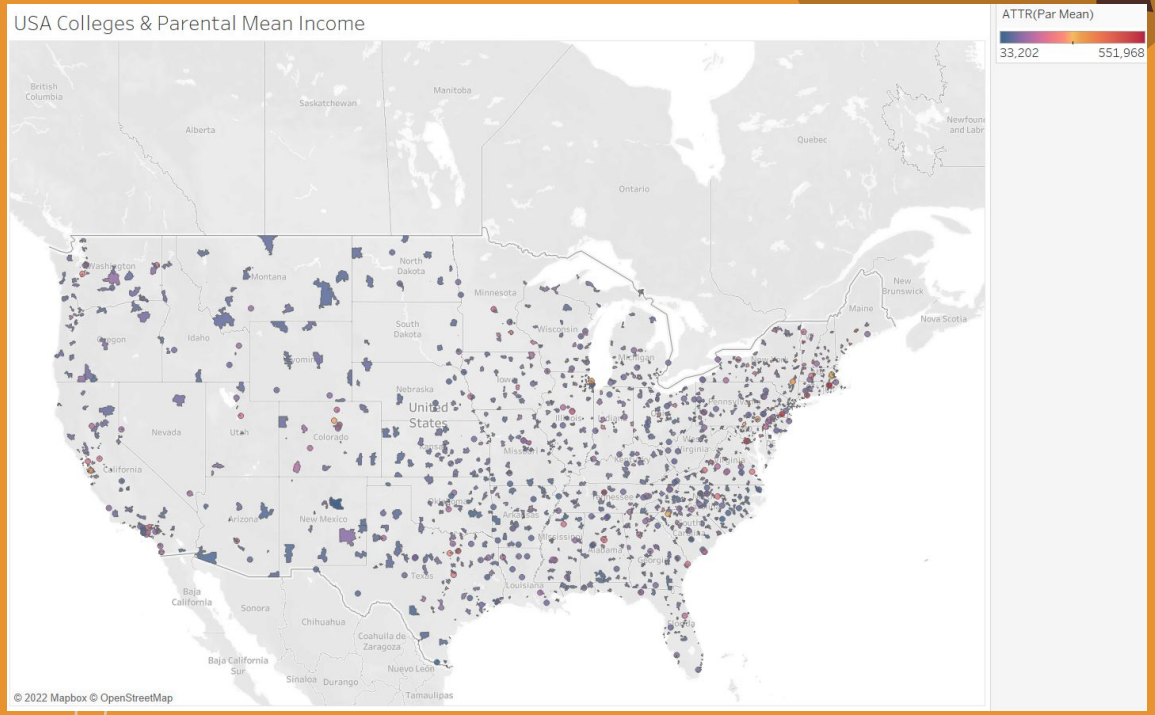


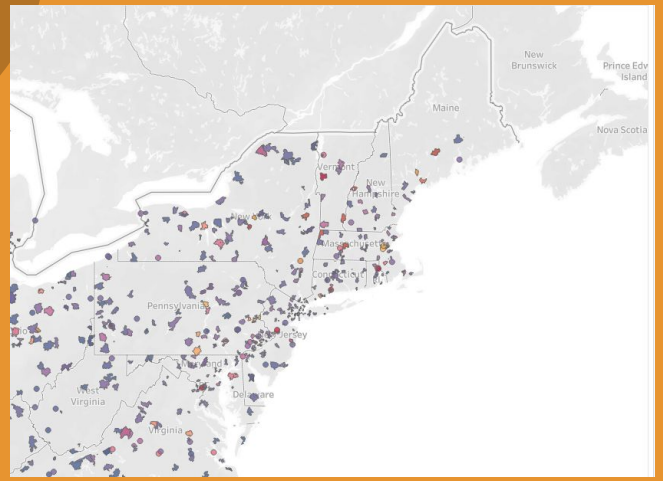
RStudio: Notebook Output

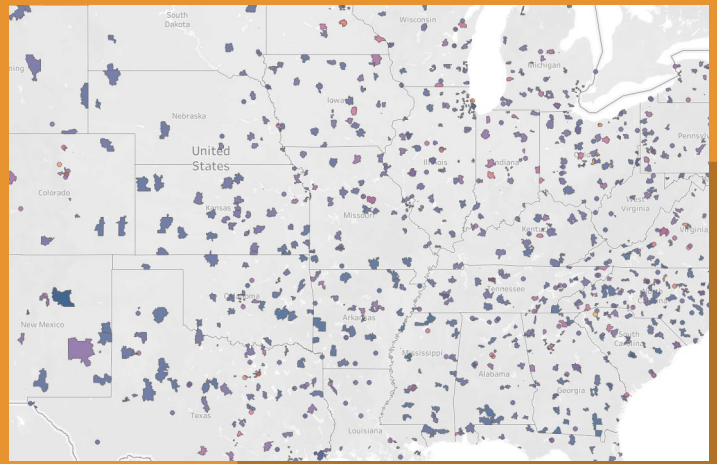
	meanincomebyincomeprctle	medianincomebyincomeprctle	rejectionratebyincomeprctle
(Intercept)	72628.901***	65261.719***	0.300***
	(440.229)	(399.579)	(0.006)
par_top1pc	2280860.149***	814847.125***	2.377***
	(13639.970)	(12380.482)	(0.138)
Num.Obs.	2202	2202	1232
R2	0.927	0.663	0.195
R2 Adj.	0.927	0.663	0.195
AIC	49453.4	49026.8	-871.8
BIC	49470.5	49043.8	-856.5
Log.Lik.	-24723.716	-24510.379	438.903
F	27962.143	4331.888	298.715

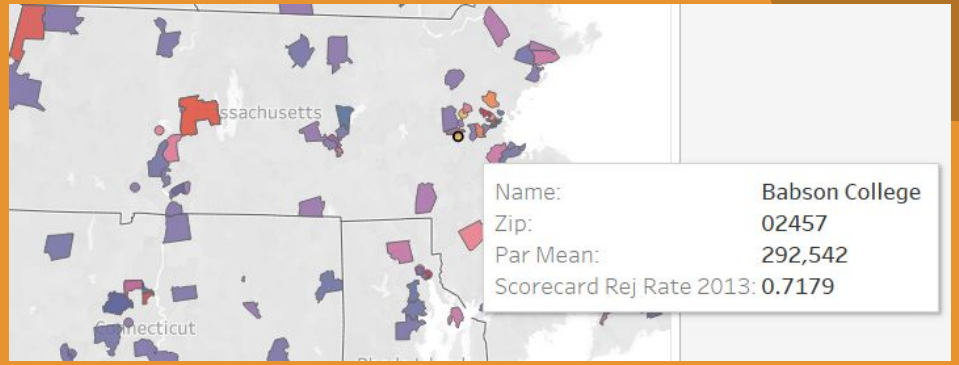
+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

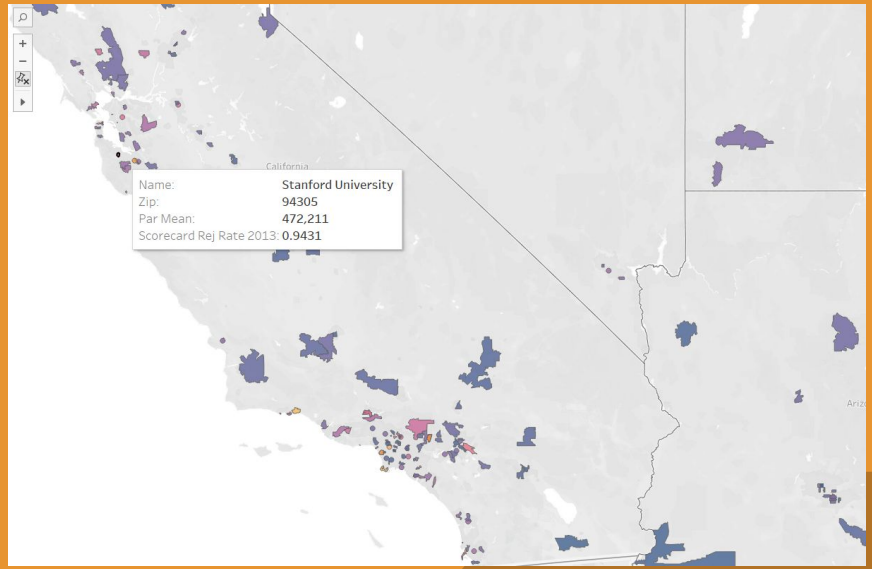
	meanincomebystickerprice	medianincomebystickerprice
(Intercept)	55410.955***	57010.924***
	(1651.018)	(696.015)
sticker_price_2013	3.412***	1.387***
	(0.079)	(0.033)

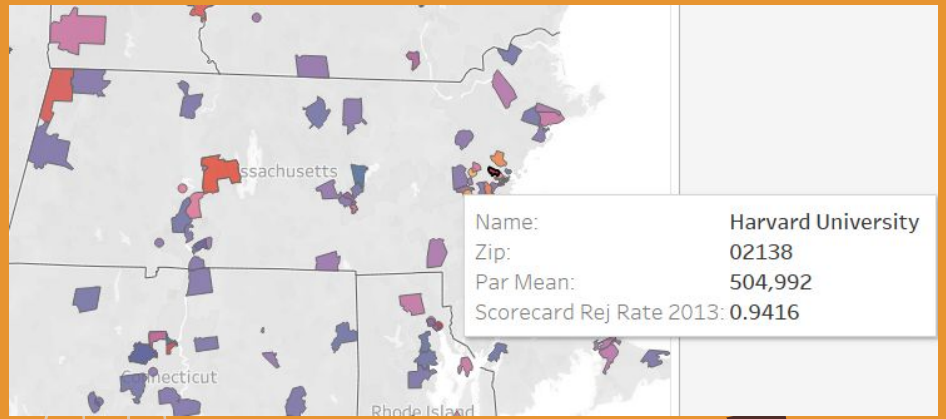

USA Colleges & Parental Mean Income
ATTR(Par Mean)
33,202
551,968
United States
© 2022 Mapbox © OpenStreetMap


New Brunswick
Prince Edward Island
Maine
Nova Scotia
Vermont
New Hampshire
Pennsylvania
New Jersey
Delaware
Virginia


South Dakota
Wisconsin
Michigan
Nebraska
Iowa
United States
Colorado
Missouri
Virginia
New Mexico
Arkansas
Tennessee
Mississippi
Alabama
Georgia
Texas
Louisiana


Name: Babson College
Zip: 02457
Par Mean: 292,542
Scorecard Rej Rate 2013: 0.7179


Name: Stanford University
Zip: 94305
Par Mean: 472,211
Scorecard Rej Rate 2013: 0.9431


Name: Harvard University
Zip: 02138
Par Mean: 504,992
Scorecard Rej Rate 2013: 0.9416

Possible Solutions:

Lower College Tuition

- Tuition cap
- Transparent pricing strategies
- Pandemic & inflation are not helping

Fix the College Admissions Process

- Acceptance rates are lowering as more students are applying
- Common App flaws

Increase Federal Spending

- Colleges and high schools in lower income/rural America

THANK YOU!

Questions?