

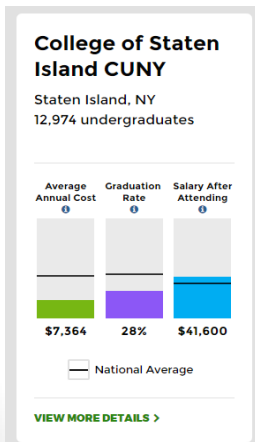


## Statistical Analysis of College Scorecard Data

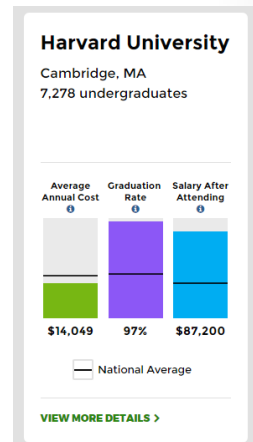
By Jennifer Freund

## College Scorecard Website

- Interactive site that aims to aid college-bound students, families and counselors



- Provides institutional data
  - Costs
  - Earnings After School
  - Financial Aid
  - Graduation and Retention Rates



## College Scorecard Raw Data

- 7804 United States Universities
- 1724 Variables
  - Admission Rates
  - Average Faculty Salary Per Month
  - Control of Institution
  - Carnegie Classification – basic
  - Enrollment of undergraduate degree-seeking students
  - In and Out of State Tuition
  - Total share of enrollment of undergraduate degree-seeking students who are: White, Black, Asian, Hispanic or Two or more Races

## Problem Statement

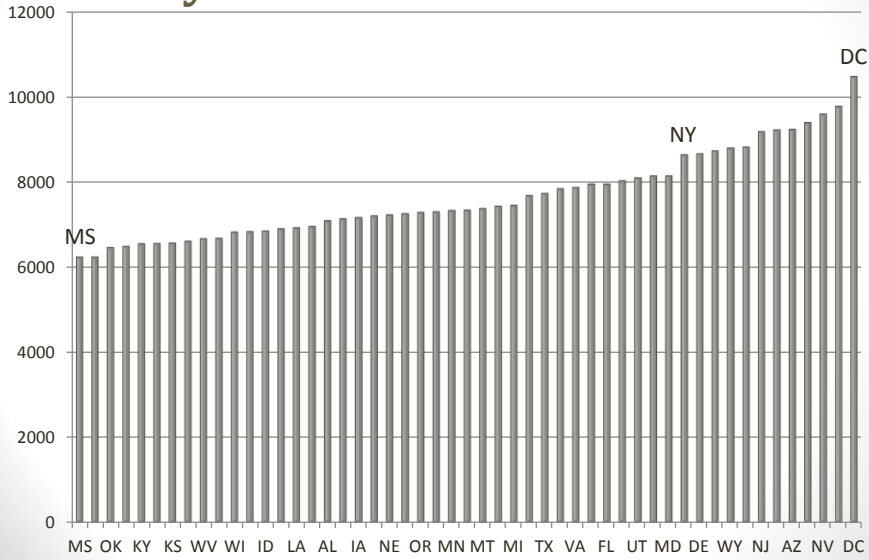
- Are there characteristics of universities that are determinants of a faculty members salary?
- What outside data can supplement College Scorecard analysis?
- Are these determinants consistent between public and private universities?

# Tools

- RapidMiner
  - Cleaning the Data
- Microsoft Excel
  - Graphing the Data
- ArcGIS
  - Mapping the Data
- STATA
  - Multivariable analysis

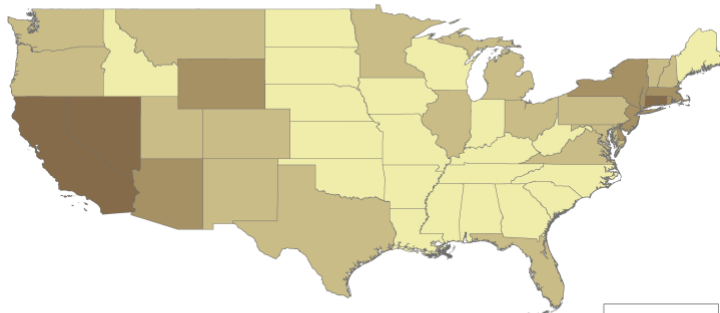
Statistically and Visually Analyzing  
Faculty Salary Across the United States

# Average Monthly Faculty Salary Across the United States

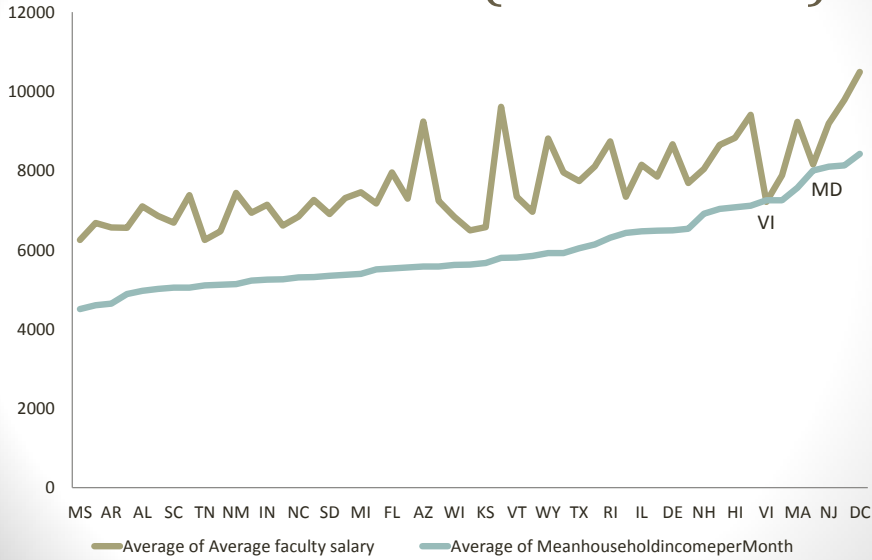


# Average Monthly Faculty Salary Across the United States

Average Faculty Salary per Month by State

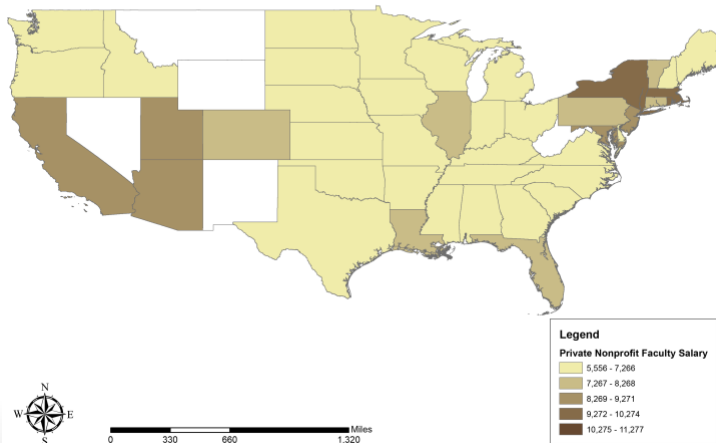


# Average Monthly Salary Across the United States (Census Data)



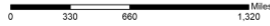
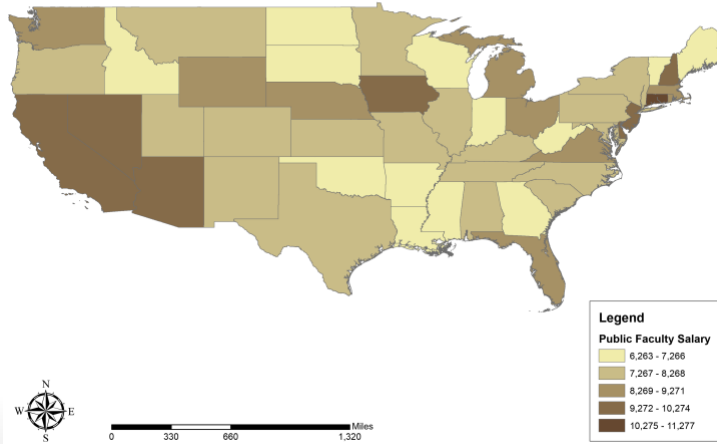
# Private Nonprofit University Average Faculty Salary Across the United States

Private Nonprofit Universities Average Faculty Salary per Month by State

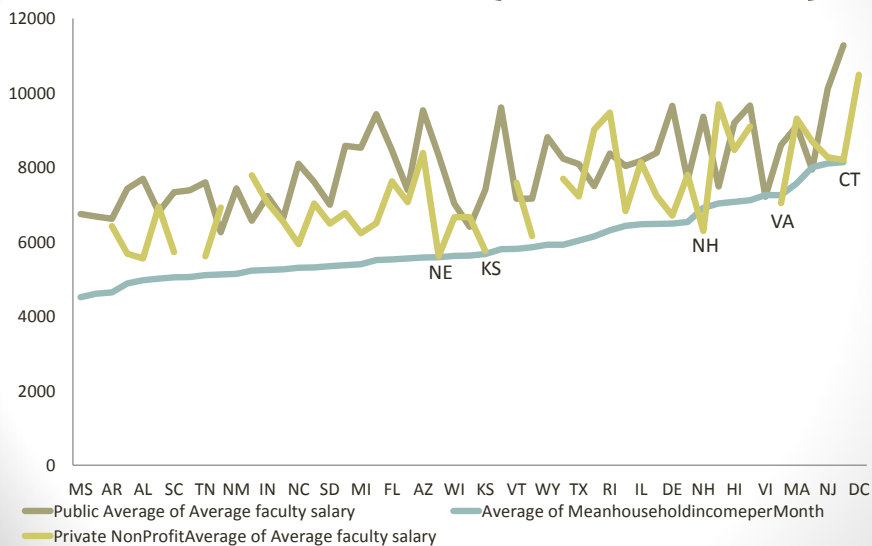


# Public University Average Faculty Salary Across the United States

Public Universities Average Faculty Salary per Month by State



# Average Monthly Salary Across the United States (Census Data)



## Multivariate Regression

## Multivariate Regression – Average Faculty Salary

R-squared	0.5267
Adj R-squared	0.5252

Average Faculty Salary	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
localeofinstitution	-35.9309	4.853493	-7.4	0	-45.45584 -26.40599
controlofinstitution	-2185.11	102.3882	-21.34	0	-2386.048 -1984.177
outofstatetuitionandfees	0.175364	0.00621	28.24	0	0.1631768 0.1875509
_cons	7529.994	196.2415	38.37	0	7144.873 7915.116

# Multivariate Regression – Average Faculty Salary

R-squared 0.7027  
Adj R-squared 0.6989

avgsal	Coef.	Std. Err	t	P>t	[95% Con Interval]	
meanhouseholdincomepermonth	0.524585	0.044464	11.8	0	0.437325	0.611846
controlofinstitution	-1148.5	99.35433	-11.56	0	-1343.49	-953.519
localeofinstitution	-9.90803	4.110301	-2.41	0.016	-17.9746	-1.84151
carnegieclassificationbasic	-163.887	19.06175	-8.6	0	-201.296	-126.478
carnegieclassificationundergradu	12.05022	21.26663	0.57	0.571	-29.6858	53.78624
carnegieclassificationssizeandset	67.47325	18.59552	3.63	0	30.9793	103.9672
averagesatequivalentscoreofstude	4.448835	0.503889	8.83	0	3.459946	5.437724
admissionrate	-592.701	218.2752	-2.72	0.007	-1021.07	-164.333
outofstatetuitionandfees	0.085484	0.006946	12.31	0	0.071853	0.099116
proportionoffacultythatisfulltim	-105.189	158.2526	-0.66	0.506	-415.761	205.3842
povertyrateviacensusdata	6.871096	20.01752	0.34	0.731	-32.4135	46.15572
unemploymentrateviacensusdata	169.8104	90.63634	1.87	0.061	-8.06461	347.6853
_cons	1668.183	862.8011	1.93	0.053	-25.0749	3361.441

# Multivariate Regression - Public Universities Average Faculty Salary

R-squared 0.7081  
Adj R-squared 0.6996

avgsal	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
meanhouseholdincomepermonth	0.504148	0.054891	9.18	0	0.39629	0.612006
flagformaincampus	-1327.57	318.1502	-4.17	0	-1952.72	-702.427
numberofbranchcampuses	-19.3273	16.36385	-1.18	0.238	-51.4813	12.82665
localeofinstitution	-5.74671	5.011663	-1.15	0.252	-15.5943	4.100904
carnegieclassificationbasic	-208.755	24.62088	-8.48	0	-257.133	-160.376
carnegieclassificationundergradu	16.83744	27.36956	0.62	0.539	-36.9421	70.61695
carnegieclassificationssizeandset	-15.2477	27.84771	-0.55	0.584	-69.9668	39.47132
admissionrate	-55.4565	272.2345	-0.2	0.839	-590.381	479.4678
averagesatequivalentscoreofstude	2.684545	0.649097	4.14	0	1.409108	3.959982
enrollmentofundergraduatedegree	0.028448	0.007684	3.7	0	0.013349	0.043546
outofstatetuitionandfees	0.086516	0.009944	8.7	0	0.066977	0.106055
proportionoffacultythatisfulltim	151.7469	250.5495	0.61	0.545	-340.568	644.0614
povertyrateviacensusdata	-13.7585	21.76837	-0.63	0.528	-56.5321	29.01499
unemploymentrateviacensusdata	167.5848	98.40487	1.7	0.089	-25.7748	360.9444
_cons	4843.888	1135.129	4.27	0	2613.428	7074.348



## Multivariate Regression – Private Nonprofit Universities Average Faculty Salary

	R-squared						0.7611
	Adj R-squared						0.7534
avgsal	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]		
meanhouseholdincomepermonth	0.605352	0.068956	8.78	0	0.469823	0.74088	
flagformaincampus	-32.3319	596.3765	-0.05	0.957	-1204.47	1139.806	
numberofbranchcampuses	139.2929	109.9914	1.27	0.206	-76.8878	355.4735	
localeofinstitution	-11.5718	6.258211	-1.85	0.065	-23.8719	0.728316	
carnegieclassificationbasic	-102.274	29.13648	-3.51	0	-159.539	-45.0079	
carnegieclassificationundergradu	-7.61177	31.94486	-0.24	0.812	-70.3972	55.17369	
carnegieclassificationssizeandset	186.0987	32.5191	5.72	0	122.1846	250.0128	
admissionrate	-1237.13	322.9571	-3.83	0	-1871.88	-602.379	
averagesatequivalentscoreofstude	5.980991	0.750029	7.97	0	4.50686	7.455121	
enrollmentofundergraduatedegrees	0.008071	0.017874	0.45	0.652	-0.02706	0.0432	
outofstatetuitionandfees	0.053316	0.010235	5.21	0	0.0332	0.073432	
proportionoffacultythatisfulltim	-393.756	197.2999	-2	0.047	-781.536	-5.97651	
povertyrateviacensusdata	69.01871	36.02938	1.92	0.056	-1.79459	139.832	
unemploymentrateviacensusdata	113.9677	156.0475	0.73	0.466	-192.733	420.6685	
_cons	-3999.71	1476.678	-2.71	0.007	-6902.02	-1097.39	

## Conclusion

- Does the model uncover characteristics of universities that are determinants of a faculty members salary?
  - Average Student's SAT Score
  - In and Out of State Tuition
- What outside data can supplement College Scorecard analysis?
  - Income Data
- Are these determinants consistent between public and private universities?
  - Each variable plays a different role between public and private universities

## Further Analysis

- Utilize data sources outside of College Scorecard and Census data
- Use different software to conduct the analysis