Correlations Between Average Faculty Salaries and Institutional Rankings for Top-Ranked Institutions

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Presented at the 2007 Annual AIRUM Conference
Bloomington, MN

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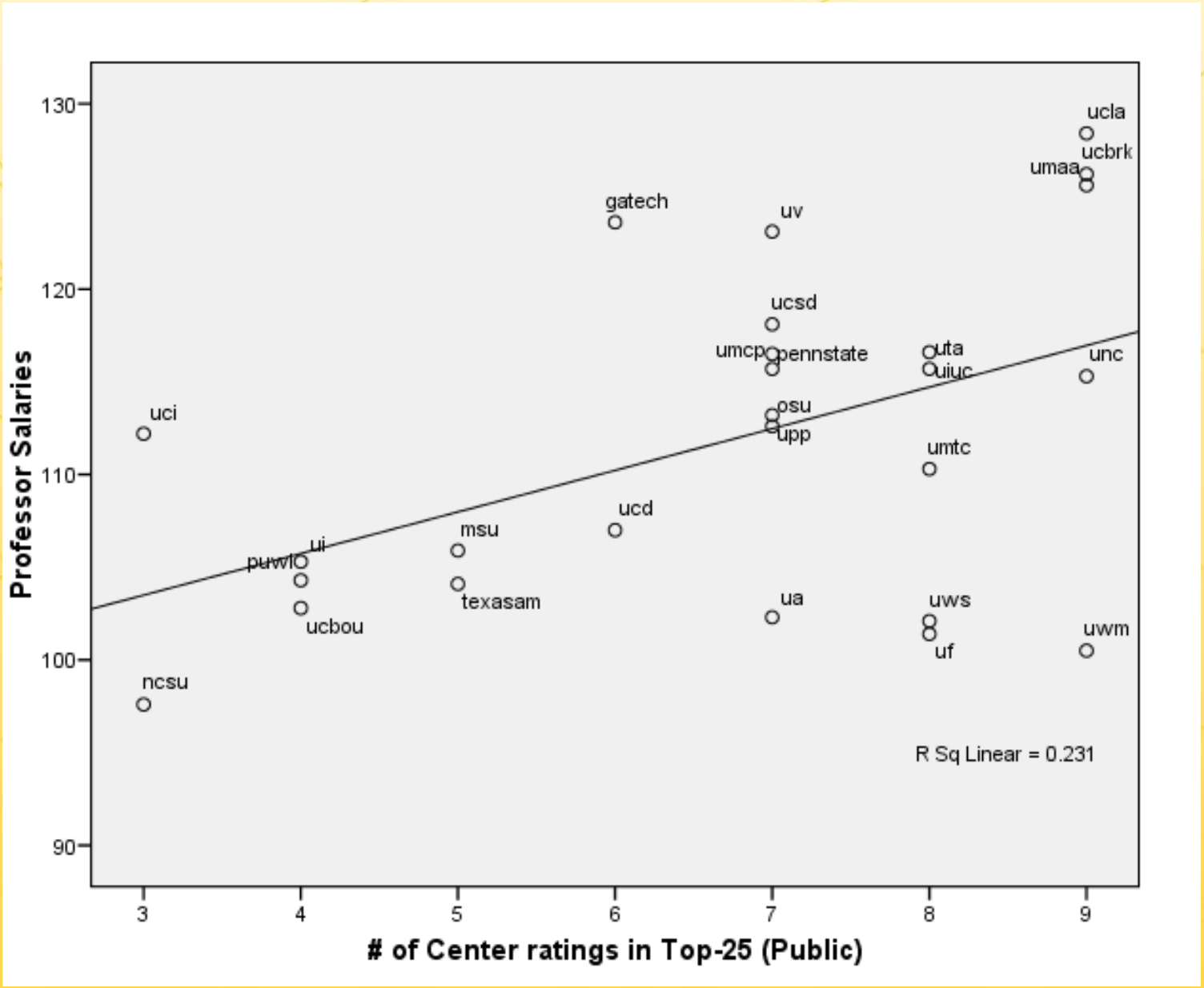
Strategic Positioning

- U of M as a top-three public research institution in the world
- Accepted usage of “The Center for Measuring University Performance” or “The Center” ranking as primary measure
- From faculty: if want to be a top-3 institution, must pay us as if we’re a top-3 institution

What started it…

- UM Faculty Consultative Committee, requested initial analysis of association between faculty salaries and “The Center” rankings.
- Found modest correlation varied between 0.42 to 0.49 (depending on faculty level)
- n=28


Professor Salaries
130
120
110
100
90
3
4
5
6
7
8
9
# of Center ratings in Top-25 (Public)
ucla
ucbrk
umaa
gatech
uv
ucsd
umcp
pennstate
uta
uiuc
unc
uci
osu
upp
umtc
ucd
msu
ui
puwl
texasam
ua
uws
ucbou
uwm
uf
ncsu
R Sq Linear = 0.231

The Rankings Systems

CMUP "The Center"

- 9 measures
- Focus on resources (research, endowment, graduates)
- Make list if in 'top-25'

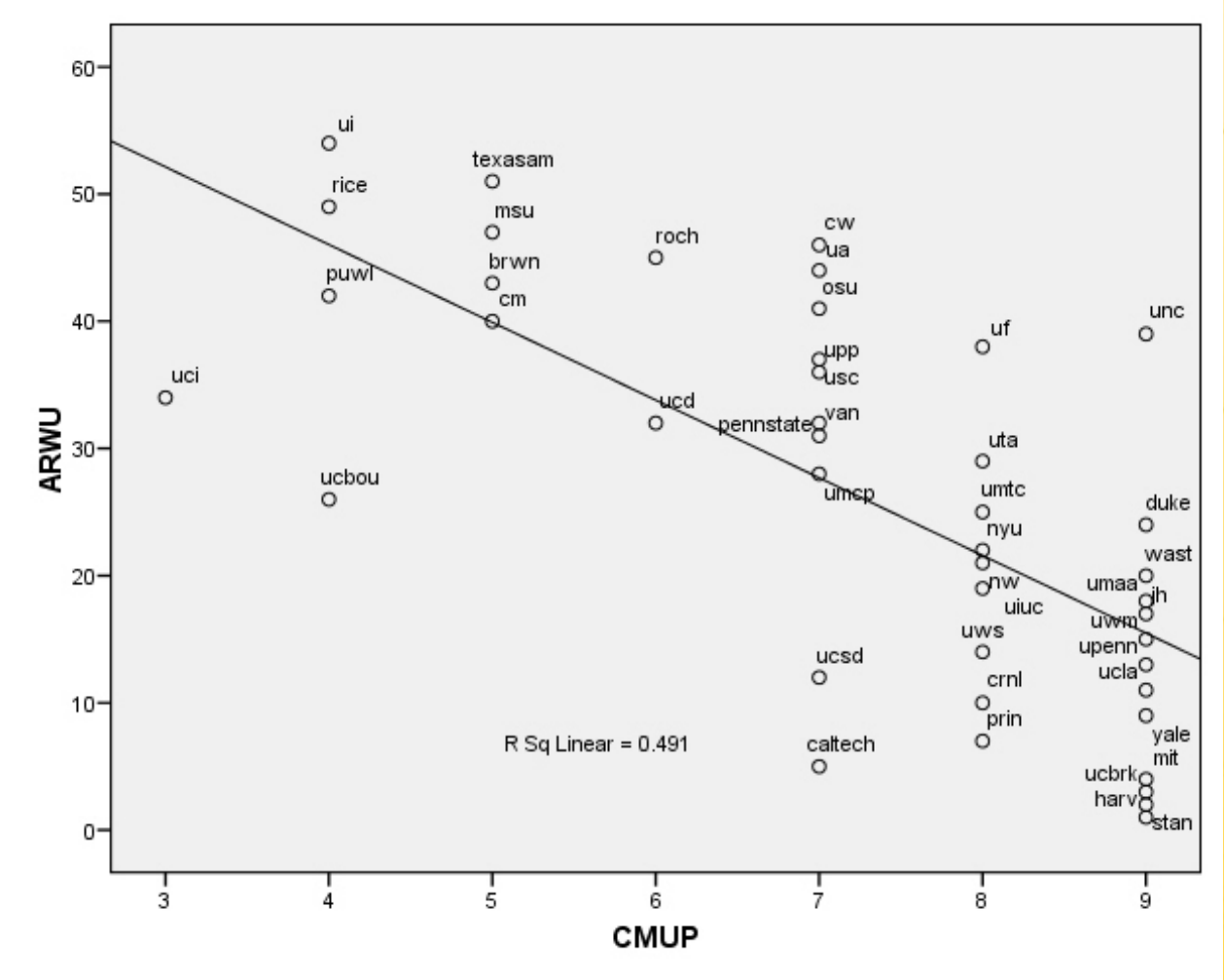
ARWU "Shanghai" Ranking

- 6 measures
- Focus on faculty productivity (Nobels, publications, highly cited)
- World, region, and national rankings

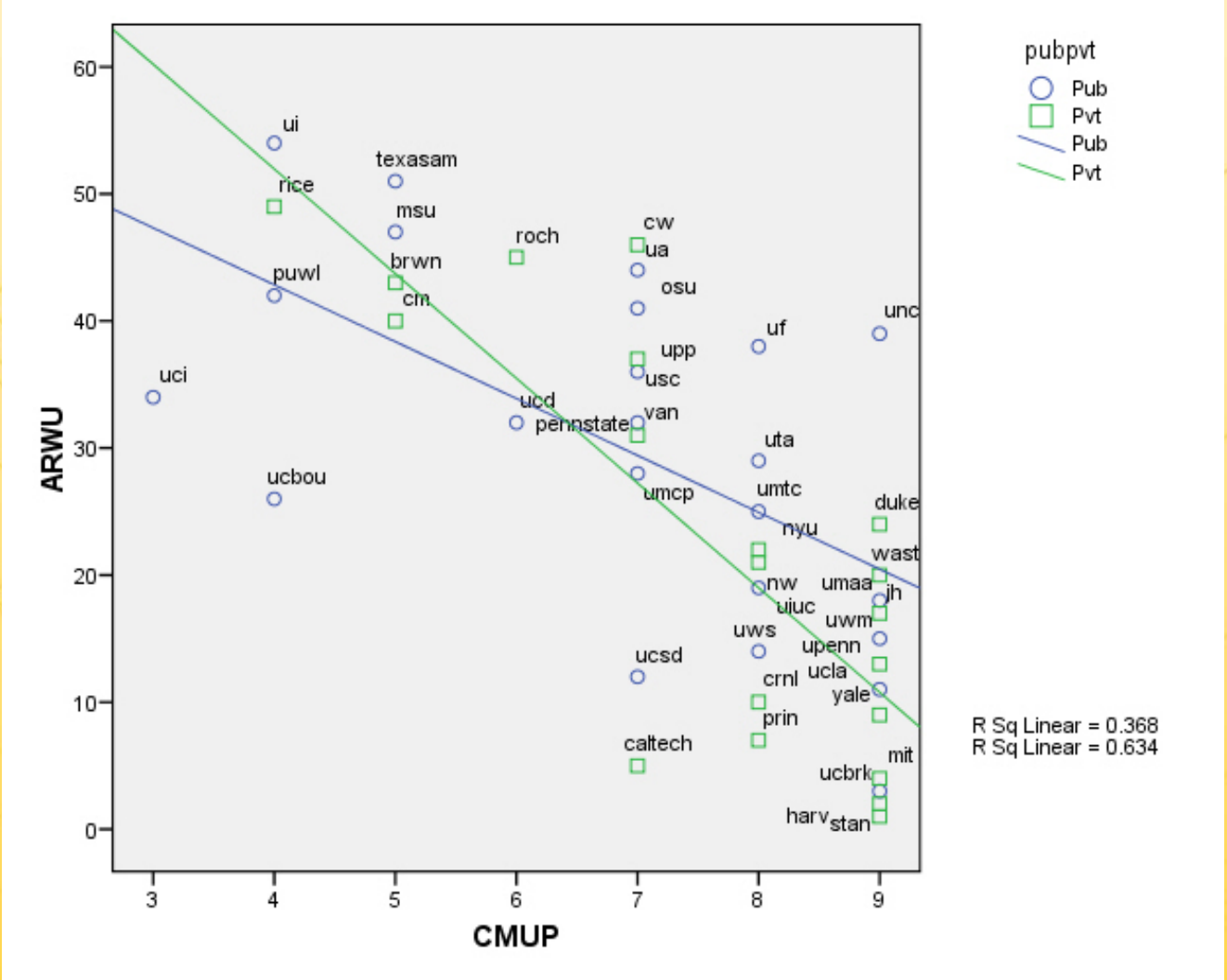
Two rankings – anything change?

- Do they rank Universities in a similar way?
  - i.e., are they related?
- Expanded pool of institutions to included privates (n=42 institutions)
- Limited by data availability
  - Center: top 50
  - Shanghai: top 100 (of world)
  - Institutions in both + AAUP salary survey

- “Shanghai” and “the Center” were positively and significantly correlated at $p<0.001$ (Spearman’s Rho)



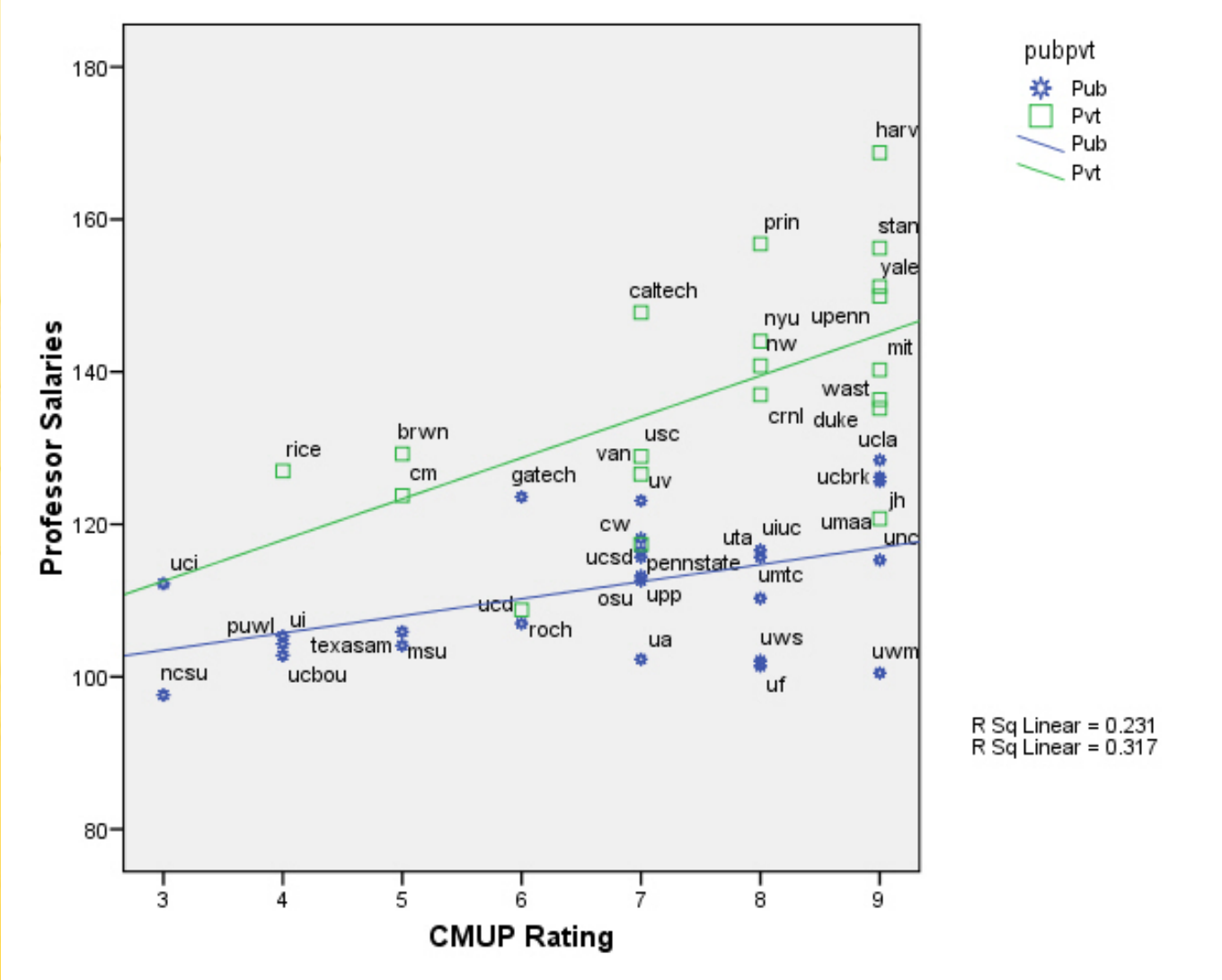
- Correlation between rankings systems stronger for private universities



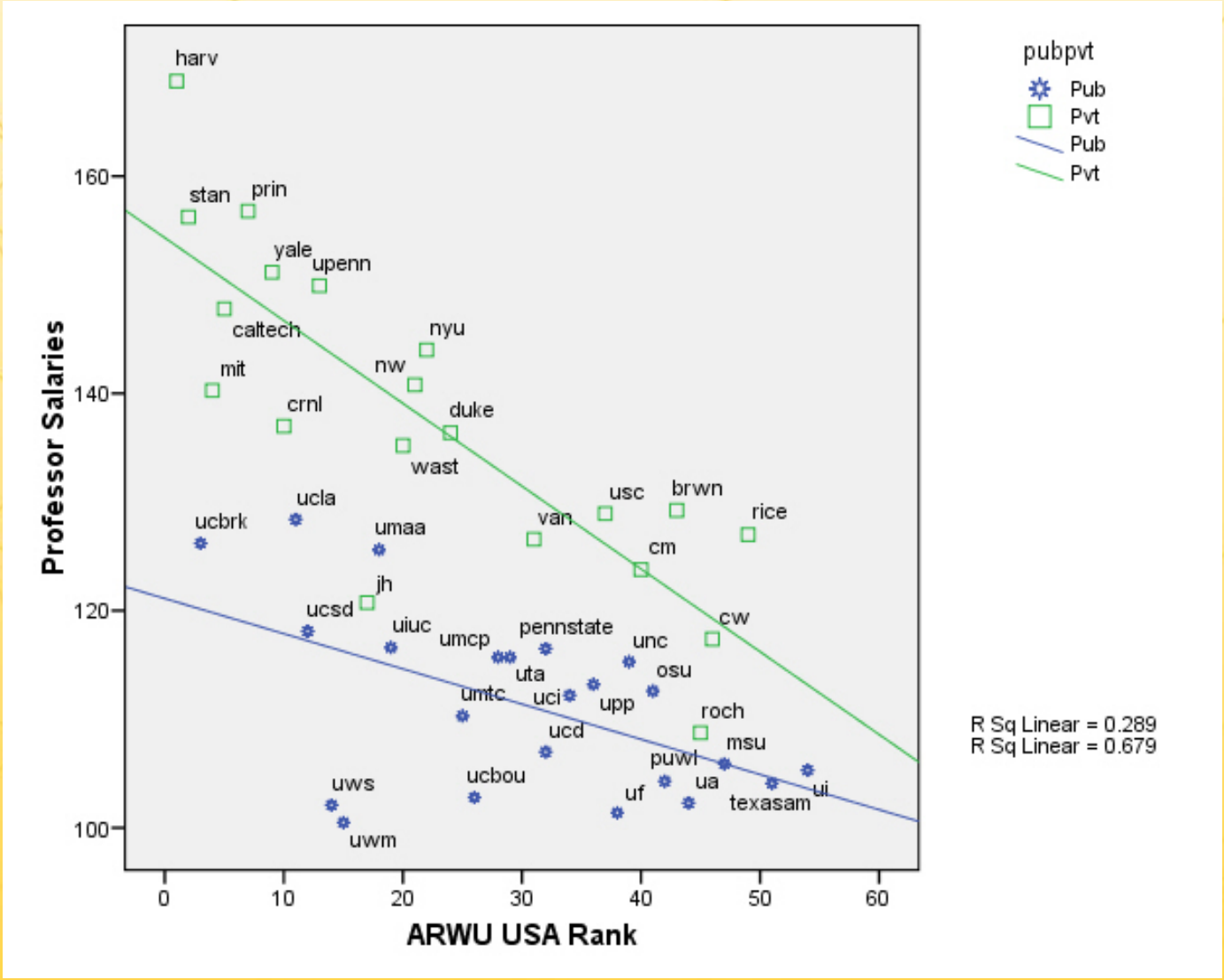
2nd report? Was this presented?

- Faculty salaries and “Shanghai”
  - For public institutions not as well, very good for private institutions
- Consistent finding in all regression models of faculty salaries and rankings; U of M consistently falls below the regression line

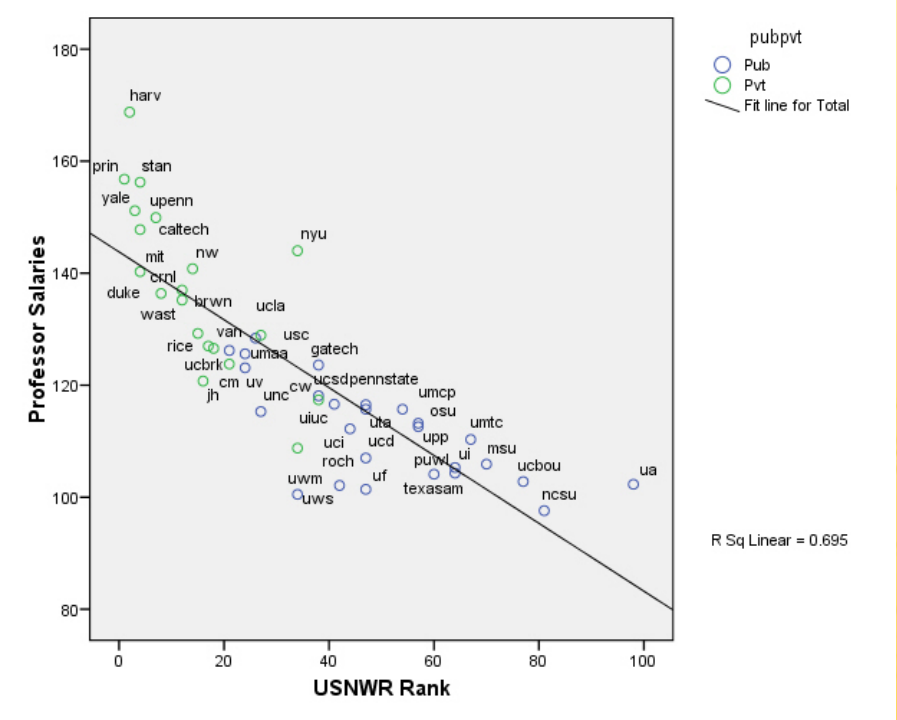
CMUP Public vs. Private

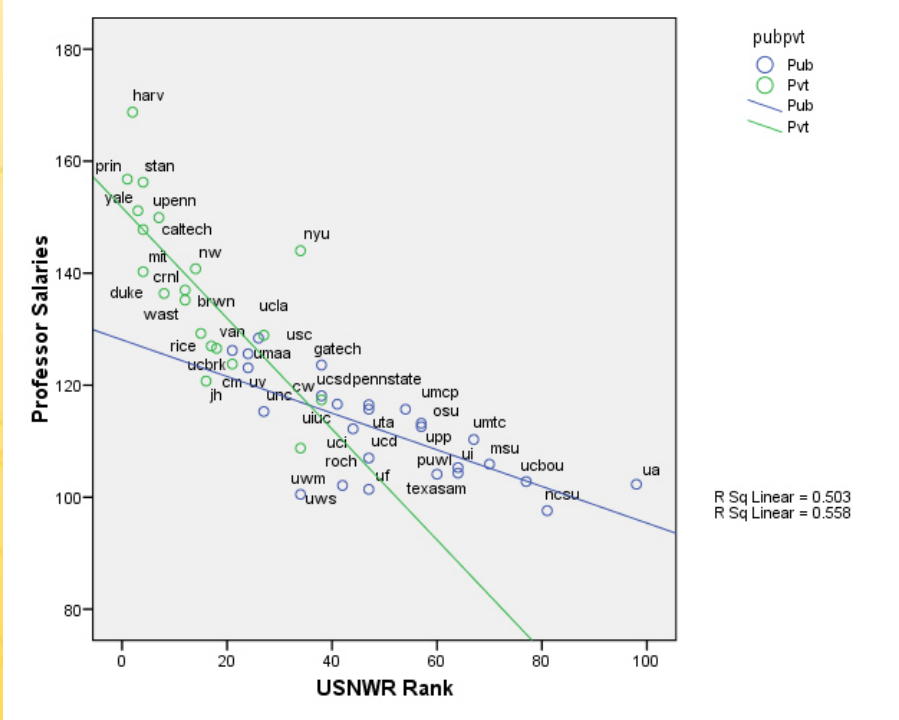


ARWU Public vs. Private



U.S. News and World Report

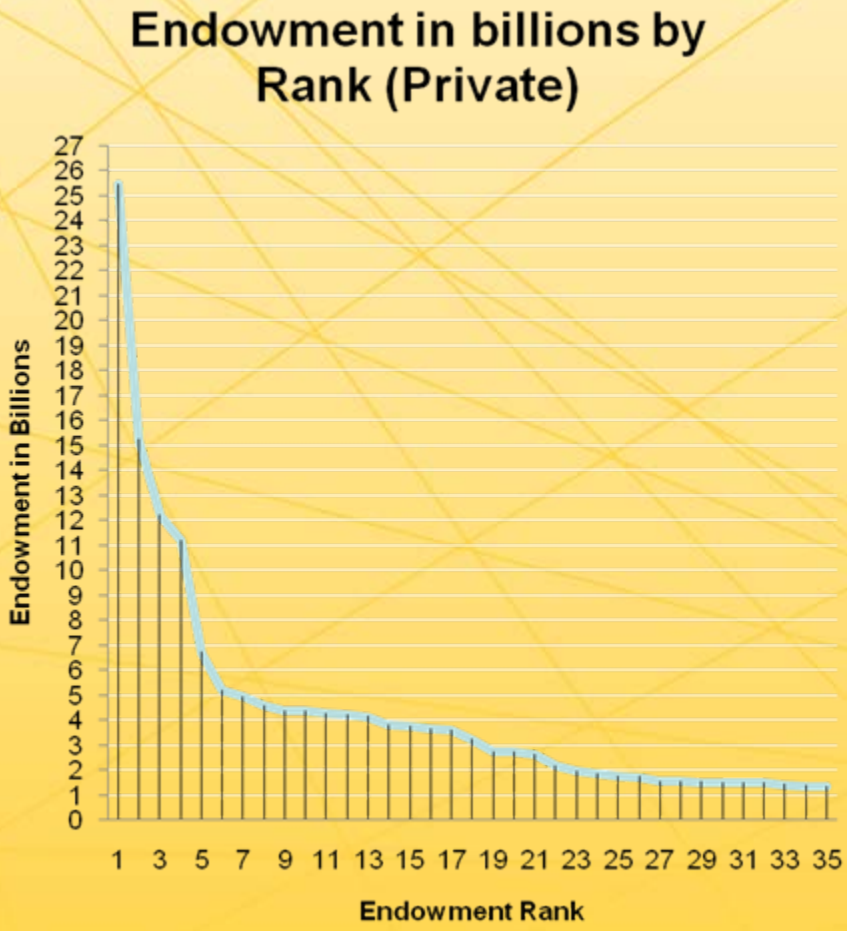


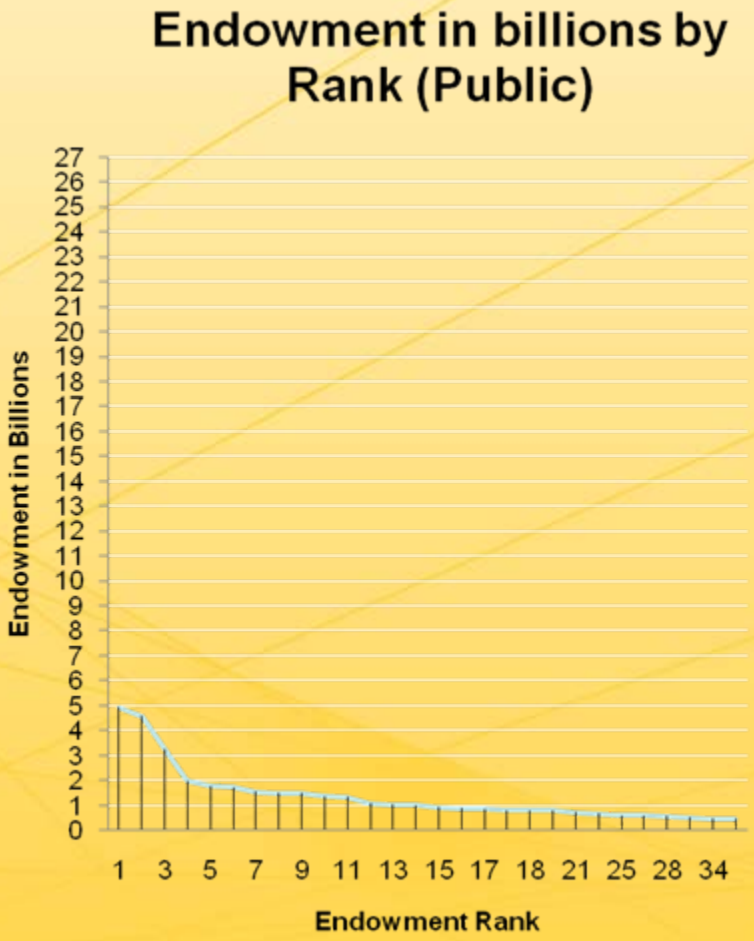


Correlation Is Not Causation

- No evidence that higher faculty salaries result in higher rankings, any more than higher rankings result in higher faculty salaries.
- Furthermore, movement within rankings gets more difficult the closer one is to the top.
- Additionally, initial evidence suggests that this relationship is volatile.

Endowment Example





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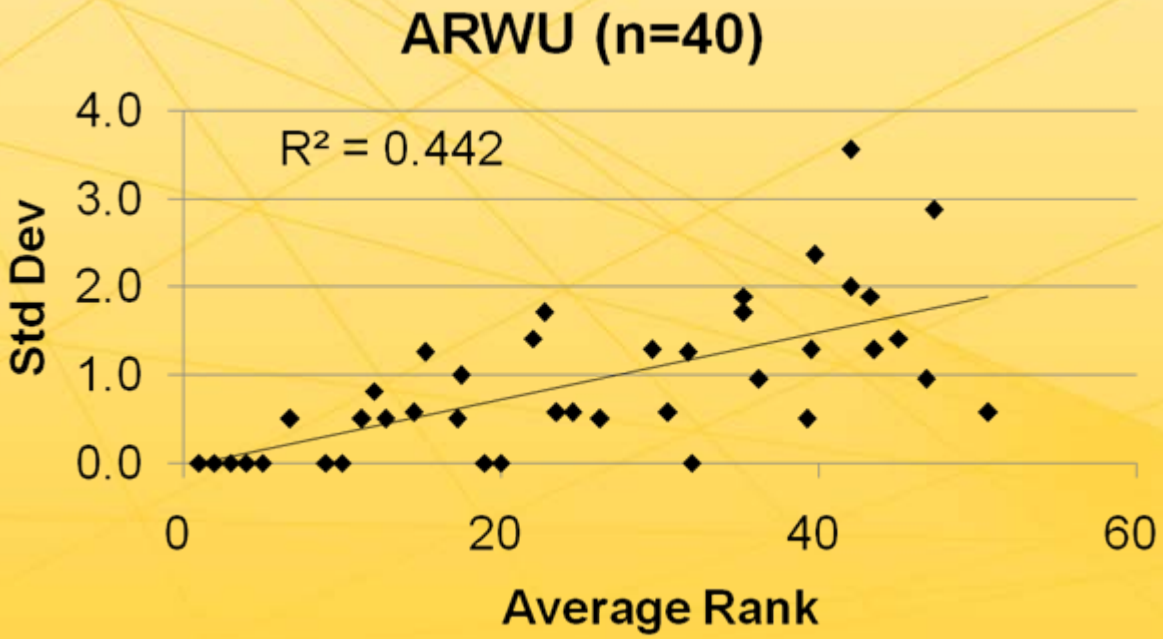
So what, then, is the impact of Faculty Salaries on Rankings

- Results depend on which ranking that we decide to use. However, institutions at the top seem to be consistently at the top.



Three limitations to the previous investigation.

- First, any planning model needs more complete specification in order to “root-out” causation.
- Second, any result identified is temporally located.
- Third, relationships between the dependent variables of interest have large variances across the different rankings.

Building a better “mouse-trap” to capture that “rascally-ranking”

- To generate more stable rankings utilize spatial plots and Euclidian distance.
- This requires the placement of an institution at a point in space that corresponds with its unique ranking across n dimensions, where n is the number of rankings.
- Now those differences in the emphasis in each ranking represent different dimensions of an institution.
- Incorporates the variances in the rankings to give us a more accurate picture of an institutional “true ranking.”

“But wait, there is more!”

- While the production of an ‘uber-ranking’ is not without its merits, this is not the most interesting aspect of this approach.
- In addition to re-ranking, multidimensional spatial plots allow us to calculate the distances between the different institutions.
- Allows for the potential to develop comparative planning models that demonstrate how to do better than the Jones’s.

Questions?

The New Rankings game.

name	ARWU	USNWR	CMUP	Euclid raw	Euclid rank
STANFORD UNIVERSITY	2	5	4.11	6.775	1
HARVARD UNIVERSITY	1	1	6.78	6.924	2
MASSACHUSETTS INSTITUTE OF TECHNOLOGY	4	7	9.22	12.249	3
YALE UNIVERSITY	9	3	12.78	15.915	4
UNIVERSITY OF PENNSYLVANIA	13	4	12.67	18.586	5
JOHNS HOPKINS UNIVERSITY	17	13	11.22	24.165	6
UNIVERSITY OF CALIFORNIA-BERKELEY	3	20	18.44	27.371	7
CORNELL UNIVERSITY	10	13	24.33	29.345	8
DUKE UNIVERSITY	23	5	18.22	29.767	9
WASHINGTON UNIVERSITY IN SAINT LOUIS	20	11	23.44	32.721	10
CALIFORNIA INSTITUTE OF TECHNOLOGY	5	7	32.78	33.888	11
UNIVERSITY OF MICHIGAN-ANN ARBOR	18	25	15.22	34.362	12
PRINCETON UNIVERSITY	7	1	34	34.728	13
UNIVERSITY OF CALIFORNIA-LOS ANGELES	12	25	24.11	36.747	14
NORTHWESTERN UNIVERSITY	25	12	26.11	38.089	15
UNIVERSITY OF WISCONSIN-MADISON	14	34	24.78	44.339	16
VANDERBILT UNIVERSITY	31	18	37.22	51.677	17
UNIVERSITY OF SOUTHERN CALIFORNIA	36	30	23.89	52.599	18
UNIVERSITY OF NORTH CAROLINA-CHAPEL HILL	40	27	30.33	57.001	19
NEW YORK UNIVERSITY	21	37	38.33	57.266	20
UNIVERSITY OF ILLINOIS-URBANA-CHAMPAIGN	19	42	34.22	57.412	21

name	ARWU	USNWR	CMUP	Euclid raw	Euclid rank
UNIVERSITY OF WASHINGTON	15	45	34.11	58.426	22
UNIVERSITY OF CALIFORNIA-SAN DIEGO	11	32	51.11	61.297	23
CARNEGIE MELLON UNIVERSITY	39	22	59	74.068	24
UNIVERSITY OF TEXAS-AUSTIN	30	52	43.56	74.169	25
UNIVERSITY OF FLORIDA	38	50	40.89	74.939	26
UNIVERSITY OF ROCHESTER	44	34	50.56	75.152	27
PENNSYLVANIA STATE UNIVERSITY-UNIVERSITY PARK	32	48	51.33	77.221	28
CASE WESTERN RESERVE UNIVERSITY	42	37	53.33	77.314	29
UNIVERSITY OF PITTSBURGH	37	58	39.44	79.302	30
BROWN UNIVERSITY	48	15	67.67	84.308	31
UNIVERSITY OF CALIFORNIA-DAVIS	32	48	61.78	84.525	32
UNIVERSITY OF MINNESOTA-TWIN CITIES	**24**	**74**	**33.22**	**84.591**	**33**
OHIO STATE UNIVERSITY-COLUMBUS	41	60	47	86.545	34
UNIVERSITY OF MARYLAND-COLLEGE PARK	28	55	62.56	87.876	35
UNIVERSITY OF COLORADO-BOULDER	26	25	81.89	89.481	36
TEXAS A&M UNIVERSITY-COLLEGE STATION	50	60	62.22	99.858	37
UNIVERSITY OF IOWA	52	60	63.33	101.563	38
UNIVERSITY OF CALIFORNIA-IRVINE	34	40	88.33	102.756	39
PURDUE UNIVERSITY-WEST LAFAYETTE	43	60	74.33	104.759	40
MICHIGAN STATE UNIVERSITY	46	74	78.89	117.539	41
UNIVERSITY OF ARIZONA	45	97	83.22	135.499	42