

## [A Big10 IPEDS Comparison FY2013 – FY2019](#)

### What IPEDS is

All accredited US institutions of higher learning that receive Federal funding of any kind are required by Federal Law to report their educational data to the Integrated Postsecondary Education Data System (IPEDS) in a timely and accurate manner, and there are potential penalties for not doing so.

Moreover, what they report and the form in which they report it is very detailed, and designed to be consistent between institutions.

This data goes into their database, and which "buckets" they go into are determined by the Standard Occupational Classification (SOC) code and IPEDS "crosswalk" system (see: [https://nces.ed.gov/ipeds/resource/download/IPEDS\\_HR\\_2010\\_SOC\\_Crosswalk.pdf](https://nces.ed.gov/ipeds/resource/download/IPEDS_HR_2010_SOC_Crosswalk.pdf)). All IPEDS data presented here is based on the autumn snapshot for the given fiscal year (so FY2014 data was based on the snapshot taken in autumn 2013).

### Part I: Non-medical Full-time tenure-track faculty - comparisons

#### Full-time tenure track faculty vs. total staffing (non-medical)

The following tables compare the component of full-time non-medical staffing (FTS-N, FTS-O; numbers and outlay) comprising full-time tenure-track faculty (FTTTF-N, FTTTF-O; numbers and outlay) to their Big10 peers.

*Table 1 - OSU v Big10 FTTTF-N/FTS-N FY13 - FY19*

<b>OSU v. Big10</b>	<b>FY2013</b>	<b>FY2014</b>	<b>FY2015</b>	<b>FY2016</b>	<b>FY2017</b>	<b>FY2018</b>	<b>FY2019</b>
OSU FTTTF-N	2106	2147	2156	2116	2173	2234	2263
OSU FTS-N	11358	11616	11730	11697	11995	12386	12639
Big10 FTTTF-N w/out OSU	21167	21679	22149	22494	22634	22726	23470
Big10 FTS-N w/out OSU	117864	121716	124066	125372	128631	132100	134516
OSU FTTTF-N/FTS-N	18.54%	18.48%	18.38%	18.09%	18.12%	18.04%	17.90%
Big10 w/out OSU FTTTF-N/FTS-N	17.96%	17.81%	17.85%	17.94%	17.60%	17.20%	17.45%
OSU ratio/Big10 ratio	1.03	1.04	1.03	1.01	1.03	1.05	1.03
FTTTF-N/FTS-N rank(out of 14)	7 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	7 <sup>th</sup>	6 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>

We see that, over the 7-year period FY2013 – FY2019, the OSU FTTTF-N/FTS-N has consistently been about 3% above the Big10-minus-OSU non-medical FTTTF-N/FTS-N ratio. So with respect to this ratio, OSU fares reasonably well. Moreover, the total percentage of OSU’s FTS outlay (i.e., base pay) awarded to full-time tenure-track faculty has been at or near the median of the Big10 for each of the last 7 years, as shown in the following table.

*Table 2 - OSU's FTTTF-O/FTS-O ranking in the Big10 FY13 - FY19*

OSU	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
FTTTF-O/FTS-O	30.85%	30.51%	30.40%	30.05%	29.91%	29.66%	29.31%
Big10 FTTTF-O/FTS-O w/out OSU	29.89%	29.69%	28.92%	29.96%	29.40%	28.88%	29.01%
FTTTF-O/FTS-O rank (out of 14)	7 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	8 <sup>th</sup>	8 <sup>th</sup>	8 <sup>th</sup>	7 <sup>th</sup>

However, the long-term trend indicated here is more concerning. Over the 6-year period FY2013 – FY2019, OSU’s FTTTF-O/FTS-O ratio (the percentage of its total non-medical staffing outlay that has gone to the base salary of regular tenure-track faculty) has decreased by 5%, compared to the average of 3% for the remaining institutions. Moreover, OSU’s decrease has been continuous, while the non-OSU average has not.

#### Full-time tenure-track faculty – average base salary

The average base pay for OSU’s non-medical full-time tenure-track faculty is computed as the ratio FTTTF-O/FTTTF-N. The results are given in the following table:

*Table 3 - OSU v Big10 FTTTF-O/FTTTF-N FY13 - FY19*

OSU v. Big10	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
OSU FTTTF-O/ FTTTF-N	\$108,393	\$109,697	\$111,249	\$113,682	\$116,236	\$117,705	\$120,225
Big10 FTTTF-O/ FTTTF-N w/out OSU	\$113,044	\$115,930	\$119,046	\$121,486	\$123,976	\$126,638	\$127,592
OSU ratio/non-OSU ratio	95.86%	94.62%	93.45%	93.57%	96.17%	92.95%	94.23%
OSU ranking (out of 14)	9 <sup>th</sup>	8 <sup>th</sup>	10 <sup>th</sup>	9 <sup>th</sup>	8 <sup>th</sup>	10 <sup>th</sup>	9 <sup>th</sup>

During this period we see that OSU’s Big10 peers have an FTTTF-O/FTTTF-N ratio that has run about 6% above that of OSU’s. From the last line of the graph we also see that OSU’s relative standing has been quite consistent, never rising above 8<sup>th</sup> or below 10<sup>th</sup> place. The 7-year average puts it squarely in 9<sup>th</sup> place.

Ratio of full-time enrolled students (FTE) to non-medical full-time tenure track faculty (FTTTF-N)

The ratio of students to tenure-track faculty is one of the standard measures of the instructional health of an institution. Typically above 20 is problematic, and well above 20 is often considered a red flag.

Table 4 - OSU v Big10 FTE/FTTTF-N FY2013 – FY2019

OSU v. Big10	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
OSU FTE/FTTTF-N	24.62	24.63	24.85	25.49	25.20	24.66	24.84
Big10 FTE/ FTTTF-N w/out OSU	22.31	22.23	21.87	21.76	22.03	21.97	21.47
OSU ratio/non-OSU ratio	110.35%	110.80%	113.63%	117.14%	114.39%	112.24%	115.70%
OSU ranking (out of 14)	12 <sup>th</sup>	12 <sup>th</sup>	13 <sup>th</sup>	13 <sup>th</sup>	12 <sup>th</sup>	11 <sup>th</sup>	12 <sup>th</sup>

Although OSU has slightly improved their FTE/FTTT-N ratio since the peak in FY2016, their ratio has been at least 10% greater than the Big10 non-OSU average, and closer to 15% greater in recent years. In terms of their relative standing they have almost always been in the bottom 20% of the Big10.

Additional FTTTF trends FY2013 – FY2019

Table 5 - OSU v Big10 FTTTF-O, FTTTF-N & FTE increases FY2013 – FY2019

Institutions 2013-2019	FTTTF-N % Incr.	FTTTF-O % Incr.	FTTTF-O/ FTTTF-N % Incr.	FTE % Incr.	FTTTF-N/ FTE % Incr.	Rank	FTTTF-O/ FTE % Incr.	Rank
Indiana University-Bloomington	6.22%	17.71%	10.81%	2.96%	3.17%	6th	14.33%	8th
Michigan State University	11.14%	28.71%	15.81%	3.15%	7.74%	3rd	24.78%	3rd
Northwestern University	7.11%	32.43%	23.64%	3.68%	3.31%	5th	27.73%	2nd
Ohio State University-Main Campus	7.45%	19.18%	10.92%	8.40%	-0.88%	11th	9.95%	12th
Pennsylvania State University-Main Campus	37.15%	46.12%	6.54%	2.89%	33.29%	1st	42.02%	1st
Purdue University-Main Campus	8.40%	23.62%	14.04%	8.80%	-0.37%	10th	13.62%	9th
Rutgers University-New Brunswick	32.79%	42.37%	7.21%	22.31%	8.57%	2nd	16.40%	6th
University of Illinois at Urbana-Champaign	9.97%	21.67%	10.64%	8.40%	1.45%	8th	12.24%	10th
University of Iowa	-7.31%	-2.96%	4.68%	6.51%	-12.97%	14th	-8.89%	14th
University of Maryland-College Park	5.57%	24.10%	17.55%	12.30%	-5.99%	13th	10.51%	11th
University of Michigan-Ann Arbor	9.77%	25.18%	14.03%	7.99%	1.65%	7th	15.91%	7th
University of Minnesota-Twin Cities	7.61%	20.34%	11.83%	0.22%	7.38%	4th	20.08%	4th
University of Nebraska-Lincoln	2.52%	16.81%	13.93%	7.35%	-4.49%	12th	8.81%	13th
University of Wisconsin-Madison	2.41%	19.63%	16.81%	2.74%	-0.31%	9th	16.45%	5th
<b>2013-2019 Big10</b>	<b>10.57%</b>	<b>24.63%</b>	<b>12.72%</b>	<b>6.89%</b>	<b>3.44%</b>		<b>16.59%</b>	
<b>2017-2018 Big10 w/out OSU</b>	<b>10.88%</b>	<b>25.15%</b>	<b>12.87%</b>	<b>6.73%</b>	<b>3.89%</b>		<b>17.26%</b>	

The above three tables allow one to compare OSU's trend lines to those of its Big10 peers. The comparison is hardly encouraging. Specifically, for the period FY2013 – FY2019

- 1. the increase in Big10-minus-OSU full-time tenure-track faculty numbers, on average, was 46% more than the increase at OSU;*
- 2. that this happened even though OSU's full-time enrollment increased at a rate 25% greater than the Big10-minus-OSU average;*
- 3. that during this period the Big10-minus-OSU increased their re-investment in FTTTF, on average, by an amount 31% greater than OSU did;*
- 4. that, even in spite of the difference in item 1., the Big10-minus-OSU group also managed to increase their FTTTF average pay by an amount 17.9% more than OSU did;*
- 5. that during this period OSU has consistently ranked either 9th or 10th in terms of average non-medical FTTTF base salary, and never above 8th place (Table 3);*
- 6. OSU has ranked near last place every year in terms of the student/regular faculty (FTE/FTTTF-N) ratio (Table 4).*

## Part I Conclusion

Although OSU is slightly above the median in terms of the percentage of outlay and numbers of its FTTTF in comparison to its total full-time non-medical staffing (Tables 1, 2), in comparison to its Big10 peers it consistently ranges from well-below-average to near-last-place in most other metrics associated to academic health, as revealed by the data in Table 3 – 5, together with the 6 summary points enumerated above.

These statistics will only change if OSU commits to drastically improving the rate of re-investment in its non-medical tenure-track faculty, something it seems that (until now) been quite reluctant to do.

## Part II: Faculty compensation and Faculty-Based Income

### Definition of Faculty-Based Income

The total annual income of OSU each year consists of various different streams. Income that is directly a consequence of faculty efforts in either instruction or research is referred to as Faculty-Based Income (FBI), which consists of three main components

- Net tuition (total tuition income minus all scholarships);
- Federal, State, Local, and Private research funding;
- State Support of Instruction.

The sum of these components will be referred to as Total Faculty-Based Income (TFBI). These amounts can be determined for a given year via line-item inspection of OSU's annual Fiscal Report<sup>1</sup>.

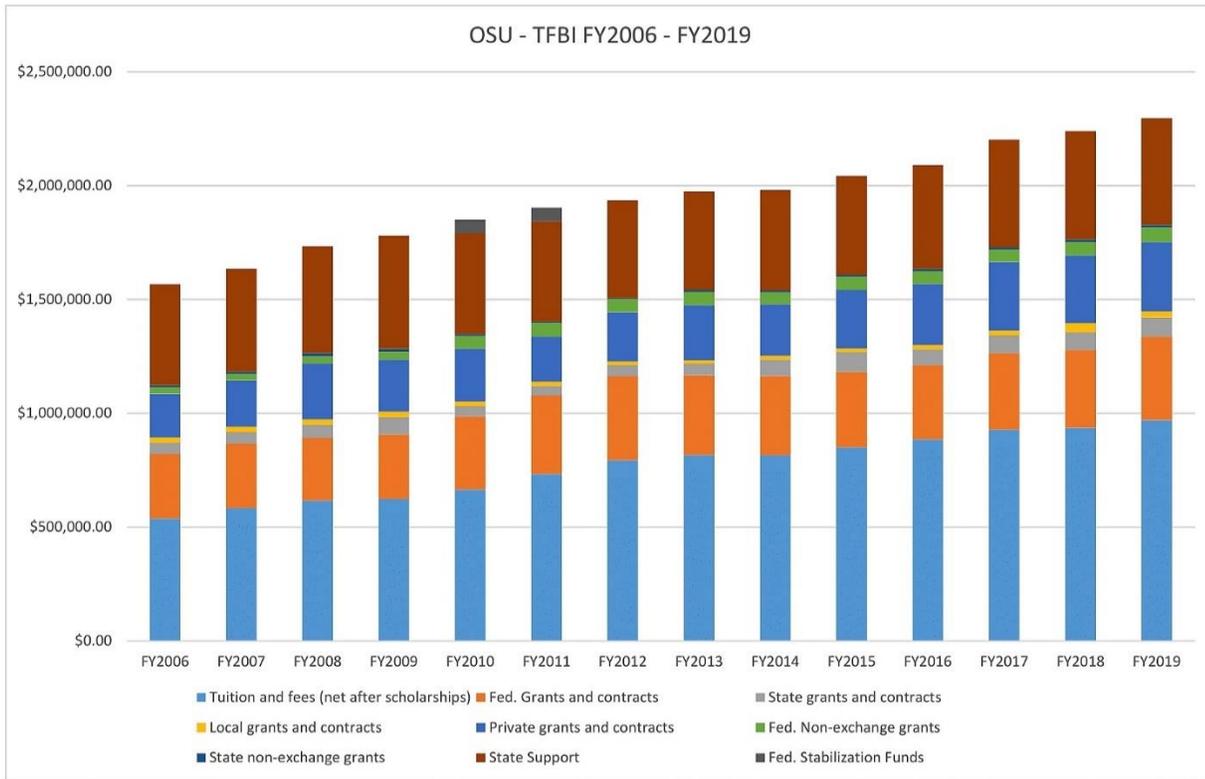
### OSU's TFBI from FY2006 – FY2019, and its relation to faculty compensation

The following graph depicts OSU's TFBI for the thirteen fiscal years FY2006 – FY2019:

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<sup>1</sup>Precisely: OSU Office of Budget and Finance annual Financial Reports' Statement of Revenues, Expenses, and other Changes in Net Position

Table 6 - OSU's Total Faculty-Based Income FY06 - FY19



This graph reflects the fact that

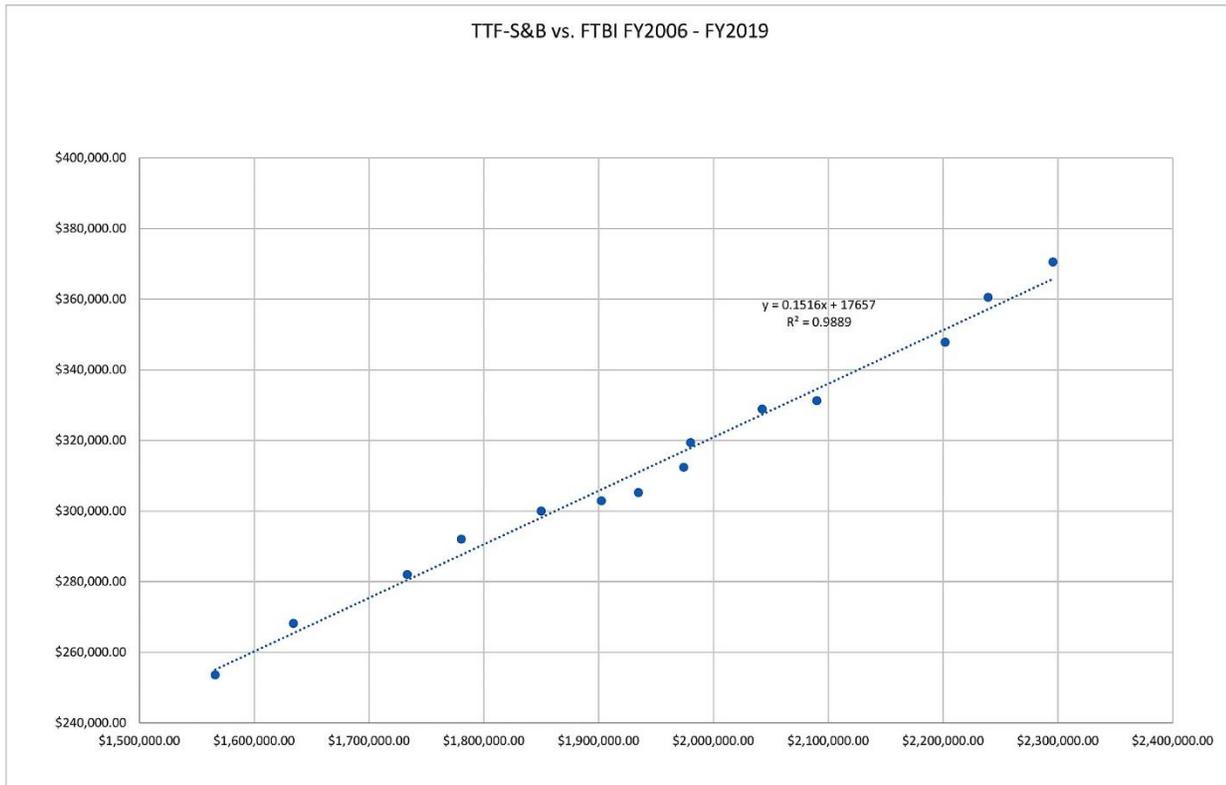
- over the thirteen-year period since FY2006, TFBI increased by 46.59% from \$1,566,027,000 to \$2,295,707,000, corresponding to an average annual rate of 2.986%;
- although there was a brief slowing down in the growth rate for the years FY2013 – FY2014, the TFBI has grown each year.

It is reasonable to ask how this income stream relates to faculty compensation; this theme was briefly discussed in the 2017 FCBC report, with a more detailed and quantified analysis appearing in the 2018 report. To make as precise a statement as possible, we consider for each year the total compensation for OSU’s regular (non-research) faculty that are not members of a clinical department<sup>2</sup>; this total compensation (TTF-S&B) is computed as their base pay supplemented by 30% (an amount representing total health and retirement benefits). The following plots TTF-S&B vs TFBI for the fiscal years FY2006 – FY2019<sup>3</sup>:

<sup>2</sup> This is the exact cohort used by HR Analytics Dept. in their institutional comparisons of faculty compensation. The compensation data provided here was computed and provided by OSU’s HR Analytics.

<sup>3</sup> TTF-S for FY2019 included ~\$1.5M additional from UITL supplemental pay incorporated into the base salary. For correlation purposes this graph only uses the estimated non-UITL component of the total base salary for this most recent year.

Table 7 - Linear regression fit of TFBI vs TTF-S&B FY2006 - FY2019

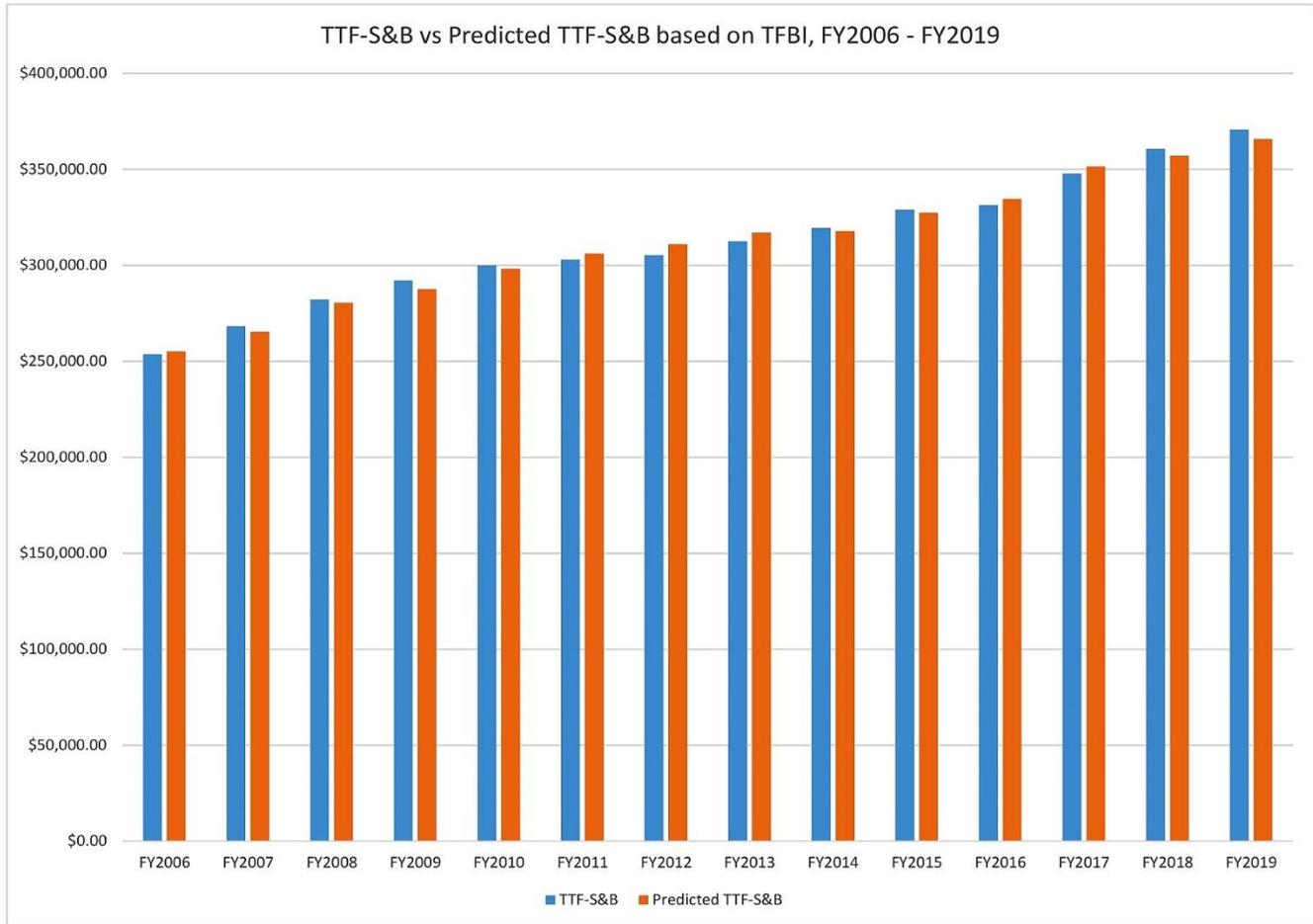


The blue line indicates a linear regression fit; an algebraic analysis reveals that

- since FY2006 TTF-S&B has amounted to 16.08% of TFBI, and has never deviated by more than .5% from this ratio;
- the Pearson correlation coefficient associated with these two sets of data is  $R = 0.99444$ ;
- the average annual increase in TTF-S&B over this 14-yr period has been 2.96% which equals 99.13% of average annual increase in TFBI of 2.986% over the same period (in other words, nearly identical annual rates of increase).

The linear expression yielding the regression line above is  $y = 0.1516x + 17657$ . Using this to compute predicted TTF-S&B (minus the new UITL-component, represented by y) as a linear function of TFBI (represented by x) produces the following comparative bar-graph:

Table 8 – Actual TTF-S&B vs predicted TTF-S&B computed using regression relation



## Part II Conclusion

The value of the correlation coefficient R suggests that the probability these two quantities are not linearly and intentionally correlated by the indicated proportionality is effectively nil. Given that the growth in TFBI has averaged a modest 2.986% since FY2006 (a slight decrease from last year), this percentage acts as a ceiling that by necessity offsets growth in tenure-track faculty, especially those in colleges with high startup costs, with

- i) severe reductions in the faculty staffing of other colleges, and
- ii) reductions in average salary raises. The question, then, is whether this level of re-investment in regular faculty is sufficient to improve, or even just maintain OSU's academic health and status.

The following record of its Shanghai ranking over the past 16 years suggest that, at least in absolute terms, the answer is almost certainly “No”.

## Part III: ARWU rankings

### ARWU rankings for the Big10 FY2005 – FY2019

The ARWU rankings of the Big10 institutions from AU2004 to AU2019 appear in the following table.

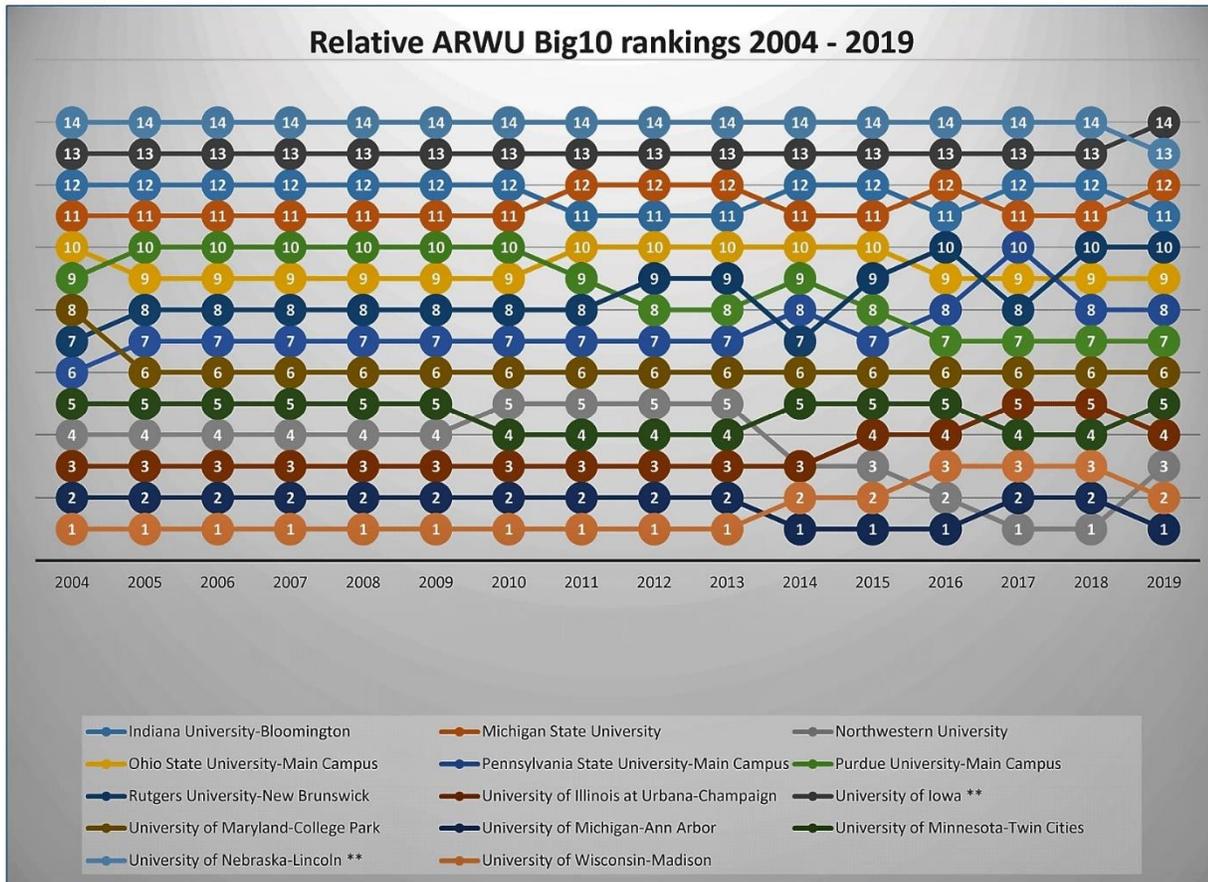
*Table 9 - Big10 ARWU World Rankings FY05 - FY19*

Institutions overall	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Indiana University-Bloomington	102	87	97	90	92	93	90	82	84	85	105	100	105	125	140	140
Michigan State University	80	77	80	80	83	86	86	92	96	92	102	99	125	120	125	145
Northwestern University	30	31	33	29	30	30	29	30	30	30	28	27	26	22	25	29
Ohio State University-Main Campus	73	63	66	61	62	62	59	63	65	65	64	67	79	80	94	100
Pennsylvania State University-Main Campus	43	39	42	43	42	45	43	45	49	54	58	60	77	85	74	98
Purdue University-Main Campus	71	75	73	68	65	65	69	61	56	57	60	61	63	77	70	72
Rutgers University-New Brunswick	44	43	46	47	54	55	54	59	61	61	52	64	96	79	101	110
University of Illinois at Urbana-Champaign	25	25	25	26	26	25	25	25	25	25	28	29	30	37	41	38
University of Iowa	110	105	100	100	100	105	110	115	115	120	160	165	180	185	190	260
University of Maryland-College Park	57	47	37	37	37	37	36	38	38	38	43	43	52	53	51	46
University of Michigan-Ann Arbor	19	21	21	21	21	22	22	22	22	23	22	22	23	24	27	20
University of Minnesota-Twin Cities	33	32	32	33	28	28	28	28	29	29	30	30	33	34	37	41
University of Nebraska-Lincoln	190	170	175	185	190	185	195	195	200	220	210	220	225	190	205	250
University of Wisconsin-Madison	18	16	16	17	17	17	17	19	19	19	24	24	28	28	28	27

There has been significant erosion of OSU’s international standing, especially within the last nine years, during which time it has dropped by 41 places, from 59<sup>th</sup> to 100<sup>th</sup>. Only Rutgers and Penn State have experienced more substantive drops.

In terms of relative standings the picture is much less severe, as depicted by the following graph.

Table 10 - Relative ARWU rankings for Big10 institutions FY05 - FY19



One sees that, in contrast to its recent international decline in absolute standing, OSU’s relative standing has been very stable, averaging 9.5 over the past 15 years, never higher than 9 or lower than 10.

In fact, since 2005 the Big10 can be partitioned into three groups according to their relative rankings in such a way that no member of one group has ever moved into another. In other words, there seem to be natural and impenetrable boundaries.

**Group 1:** The top 6, comprised of Northwestern, Univ. Ill. Urbana, Univ. Maryland, Univ. of Mich., Univ. Wisc., and Univ. Minn. In FY2019 these six institutions all ranked in the top 46 worldwide.

**Group 2:** The middle group ranked 7 – 10. This consists of Purdue, Penn. State, Ohio State, and Rutgers in that order, an order which has remained unchanged for the last four years.

**Group 3:** The bottom group ranked 11 – 14; Ind. Univ., Mich. State Univ., Univ. Neb., and Univ. Iowa.

## Part III Conclusion

OSU's relative ARWU standing has been extremely stable over the last 15 years, oscillating between 9<sup>th</sup> and 10<sup>th</sup> place out of the cohort of 14 Big10 universities. Its closest peers in this metric are Purdue, Penn. State, and Rutgers, with this group of 4 comprising the 2<sup>nd</sup> tier institutions in the Big10. And in this group of 4, OSU has always occupied the lower half.