

OIT Comparator Universities – Z-Score Analysis

Oregon Tech Institutional Research

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Objective

- Review Task and Methodology
 - Hybrid Approach
 - Z-score Analysis
 - Data Standardization
 - MGT study comparison
- Discuss Variables and Weights
 - Data standardization
 - Variable weights
- Top 10 Comparator List Quick Look
 - Review overall Top 10 comparator Universities

Peer List

- Create a peer institution list for institutional benchmarking
 - Desire to update 2010 OUS peer list
 - Necessary for improving and moving institution toward strategic goals
- Accreditation
 - Necessary for accreditation purposes

Literature Review

**Lang, 2000*

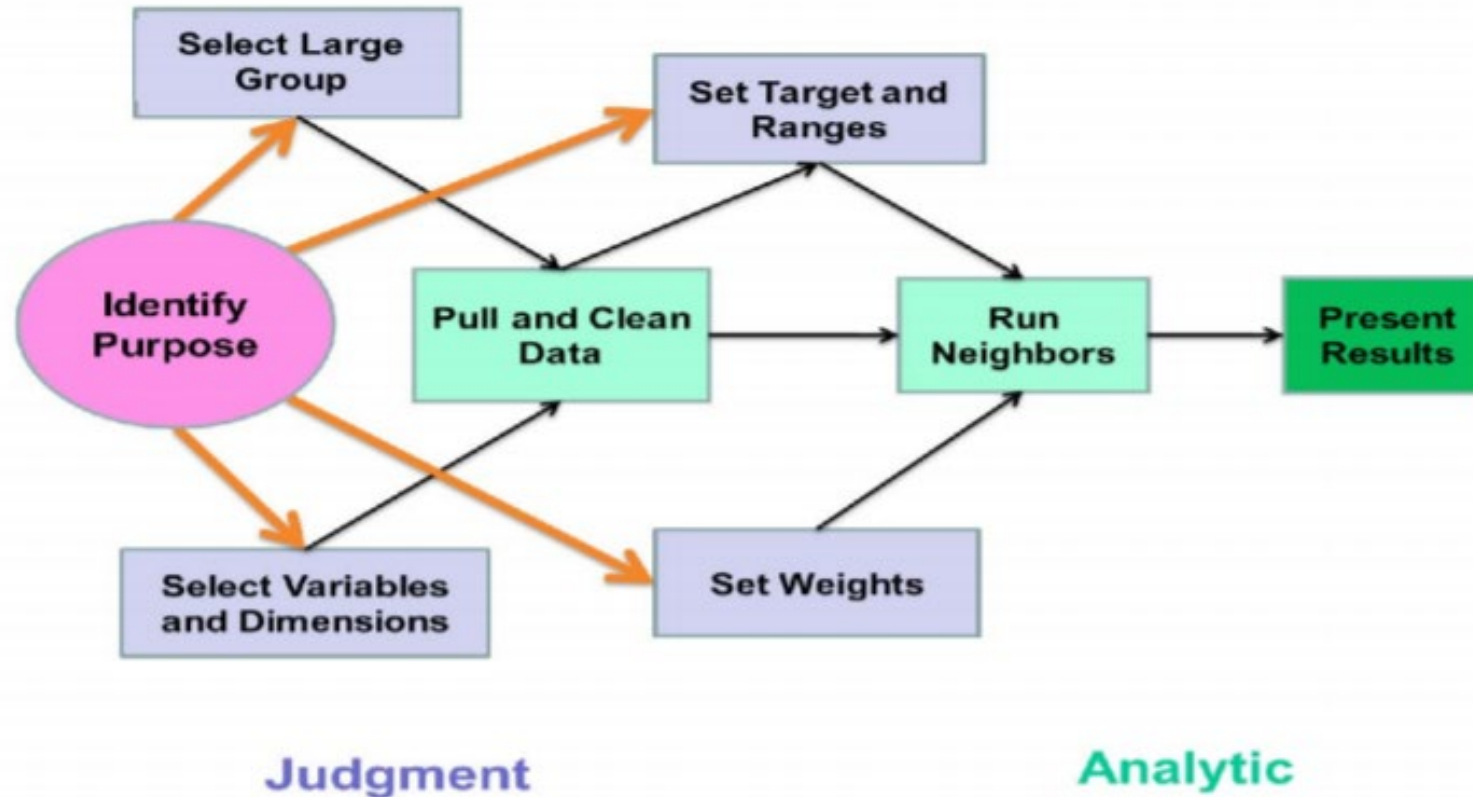
<i>Emphasis</i>			
Data + Statistics	Data + Statistics + Judgement	Data + Judgement	Judgement
Cluster Analysis	Hybrid Approach	Threshold Approach	Panel Review
<i>Technique</i>			

- Cluster Analysis and Hybrid Approach most widely used across institutions.
- Hybrid approach incorporates stakeholder judgement of panel review, while still incorporating a statistical approach like a cluster analysis.
 - Less easy to manipulate than panel review; allows for more objective results.
 - More adaptable to institutional needs (e.g. strategic plan) than cluster analysis

Hybrid Methodology

*McLaughlin et al, 2011

Figure 1. Methodology for forming reference groups



Meaningful Data

- Initial desire to include all IPEDS data and consider all institutions as possible peer
- Data quickly becomes meaningless for comparison
 - 4 yr. public with Health Professions and Engineering
 - First variable - Total Degrees Conferred -- OIT ~750
 - Average Degrees conferred: 3563.7
 - Standard Deviation: 2488.71
 - Low correlation to normal distribution
 - Similar issue to MGT study that included institutions that did not have OIT CIPs or were dissimilar in headcount/degrees conferred.
- Must develop threshold criteria for comparator analysis

Threshold Criteria

- Selecting the “Threshold Group”
 - 4 yr. Public University
 - Omit: HBCU, MEDICAL, HOSPITAL, TRIBAL
 - Total Degrees Conferred = 1500 or fewer
 - Confer > 10 BS Degrees in CIP 51 and in CIP 14 or CIP 15 (80%+ OIT degrees)
 - BS conferred > 0
 - MS conferred > 0
- Result
 - 28 potential comparator universities

Analysis Methodology

- Data is analyzed using a z-score analysis
 - Calculate z-scores for all variables and dimension
 - Distance = $|z\text{-score}_{\text{OIT}} - z\text{-score}_{\text{comparator}}|$

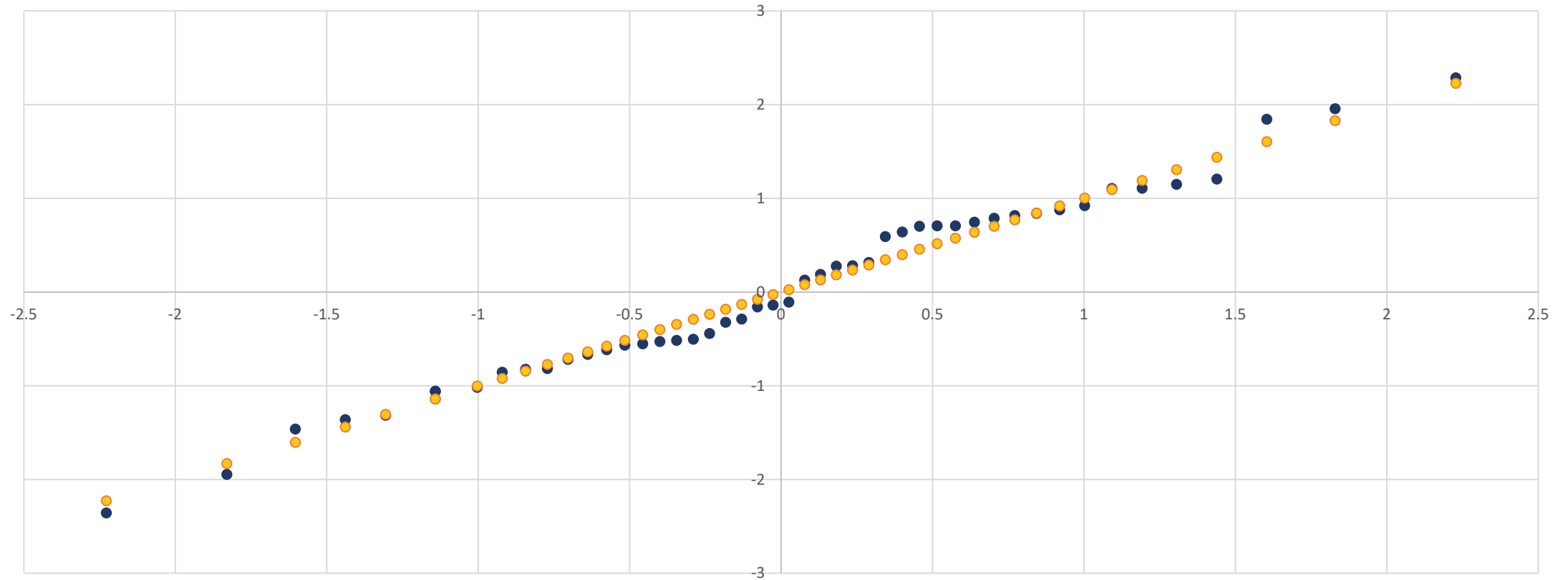
- $$\text{overall score} = \frac{\sum(\text{distance}_i * \text{weight}_i)}{\sum \text{weight}^i}$$

- Standardize the data to ensure z-score analysis is meaningful
 - Q-Q Plot for normalization
 - Correlation between theoretical and actual quantiles
 - Where institutions were omitted, highest score + 0.5 was given
- Where data cannot be made to fit a normal curve through Q-Q analysis (e.g. Discrete Locale data), judgement scores are given

Q-Q Plot Example

Correlation coefficient = 0.99

Instructional Expense per FTE



Variables

<i>Characteristic</i>	<i>Variable</i>	<i>Characteristic</i>	<i>Variable</i>	<i>Characteristic</i>	<i>Variable</i>
Enrollment (10%)	12-Mo. Headcount	Academic Offerings (30%)	% Major conferred in OIT CIP	Instructional FTE (2.5%)	Instructional FTE as % of total FTE
	%UG		CIP 03		
	12-Mo. FTE		CIP 09	Faculty Tenure (5%)	FT Instructional Faculty
	Headcount/FTE		CIP 11		Tenured Faculty
	% of UG that are degree-seeking		CIP 14		Tenured Track Faculty
			CIP 15		Non-tenured track Faculty
Degree Type (10%)	Total Conferred		CIP 26		
	%AAS		CIP 27	Faculty Education (15%)	% with Phd or Terminal Degree
	%BS		CIP 42		% with MS
	%MS		CIP 51		Total FT Faculty
	%PHD		CIP 52		Total FT with Phd or Terminal Degree
			CIP not offered at OIT		Total FT with Masters
Student Success (5%)	6 year BS grad rate				
	Retention rate	Student Profile (7.5%)	% White	Financials (5%)	Instruction expense per FTE
	Student-Faculty Ratio		% Female		Tuition Revenue per FTE
			% UG Awarded Pell		
Research Expense (5%)	Research expense as % of core		%FT-FT UG Awarded Pell		
Institution Locale (5%)	Locale – Remote Town (per IPEDS)		% Exclusively Distance Ed.		

Top-10 List

INSTNM	CITY	ST	Total Headcount	Ug Enrl	Grad Enrl	FTE	Degrees Conferred
Oregon Institute of Technology	Klamath Falls	OR	5,313	5,172	141	3,577	761
Fairmont State University	Fairmont	WV	3,803	3,563	240	3,351	866
Southwestern Oklahoma State University	Weatherford	OK	4,961	4,123	838	4,265	1,326
University of South Carolina-Upstate	Spartanburg	SC	6,308	5,853	455	5,308	1,293
Midwestern State University	Wichita Falls	TX	5,969	5,226	743	4,969	1,474
Montana Tech of the University of Montana	Butte	MT	1,714	1,493	221	1,540	546
Shawnee State University	Portsmouth	OH	3,641	3,466	175	3,146	733
Bemidji State University	Bemidji	MN	4,897	4,490	407	3,821	1,104
Nicholls State University	Thibodaux	LA	6,491	5,906	585	5,712	1,358
Missouri Western State University	Saint Joseph	MO	5,608	5,367	241	4,313	842
Rogers State University	Claremore	OK	3,585	3,549	36	2,811	581
GROUP AVERAGE 2019-20 IPEDS Data			4,754	4,383	371	3,892	989

INSTNM	CITY	ST	Avg. 9-Mo. Sal FT (All Rank)	Avg. 9-Mo. Sal FT Prof	Avg. 9-Mo. Sal FT Asoc. Prof	Avg. 9-Mo. Sal FT Asst.Prof	Avg. 9-Mo. Sal FT Inst
Oregon Institute of Technology	Klamath Falls	OR	\$ 69,150	\$ 90,253	\$ 68,956	\$ 58,246	\$ 52,620
Fairmont State University	Fairmont	WV	\$ 59,695	\$ 73,419	\$ 60,635	\$ 56,297	\$ 42,456
Southwestern Oklahoma State University	Weatherford	OK	\$ 64,562	\$ 83,750	\$ 66,993	\$ 62,522	\$ 51,743
University of South Carolina-Upstate	Spartanburg	SC	\$ 64,275	\$ 78,566	\$ 71,441	\$ 62,719	\$ 52,170
Midwestern State University	Wichita Falls	TX	\$ 71,956	\$ 94,211	\$ 77,779	\$ 62,475	\$ 50,622
Montana Tech of the University of Montana	Butte	MT	\$ 70,293	\$ 83,703	\$ 73,843	\$ 66,676	\$ 55,974
Shawnee State University	Portsmouth	OH	\$ 62,268	\$ 75,329	\$ 62,312	\$ 53,691	\$ 44,307
Bemidji State University	Bemidji	MN	\$ 79,020	\$ 93,468	\$ 80,578	\$ 68,649	
Nicholls State University	Thibodaux	LA	\$ 56,899	\$ 78,897	\$ 60,307	\$ 58,276	\$ 44,782
Missouri Western State University	Saint Joseph	MO	\$ 59,855	\$ 74,868	\$ 60,947	\$ 56,910	\$ 42,542
Rogers State University	Claremore	OK	\$ 51,254	\$ 64,342	\$ 51,127	\$ 46,170	\$ 40,425
GROUP AVERAGE 2019-20 IPEDS Data			\$ 64,475	\$ 80,982	\$ 66,811	\$ 59,330	\$ 47,764