Communicating and Learning from HBCU Successes with Benchmarking Science

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Motivations

HBCUs

• Literature shows distinct advantages for Black students

• Closure for many, mergers proposed

• Not a homogenous group, HBCUs are different organizations

• Those differences mean HBCUs can learn from each other
Benchmarking HBCUs

• Benchmarking is a method for organizations to identify and import best practices using data from peers.

• Organizations collect data from peers and use this data to learn from each other, communications successes and challenges.
Benchmarking Process

- Planning
- Collecting Data
- Analysis
- Improving Practices
Data Envelopment Analysis

• DEA uses linear programming to weight and aggregate inputs and outputs in a way that results in a single comprehensive productivity measure for each school

• Performance score of a school is given as a percentage of the productivity of its most productive peers.
  
  • 100% assigned to “top performers”

• Most importantly, DEA groups similar organizations by their input and output mixes
  
  • For instance, HBCUs with a similar student body likely to be compared to each other
Data Envelopment Analysis

Functional Form

Max: \( h_k = \frac{\sum_{r=1}^{s} (u_{rk} y_{rk})}{\sum_{i=1}^{m} (v_{ik} x_{ik})} \) \( r = 1, \ldots, s \) (outputs)

\( i = 1, \ldots, m \) (inputs)

S. T. \( \frac{\sum_{i=1}^{m} u_{rk} y_{ij}}{\sum_{i=1}^{m} v_{ik} x_{ij}} \leq 1, j = 1, \ldots, n \) (dmu's)

\( u_{rk} \geq \epsilon > 0, \ r = 1, \ldots, s \)

\( v_{ik} \geq \epsilon > 0, \ i = 1, \ldots, m \)
Data Envelopment Analysis
## Inputs/Outputs

<table>
<thead>
<tr>
<th><strong>Inputs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• SAT Median Scores</td>
</tr>
<tr>
<td>• Academic Support Expenditures</td>
</tr>
<tr>
<td>• Instructional Support Expenditures (Faculty)</td>
</tr>
<tr>
<td>• Student Services Expenditures</td>
</tr>
<tr>
<td>• Operational Expenditures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Output</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Graduation Rate</td>
</tr>
<tr>
<td>• Retention Rate</td>
</tr>
</tbody>
</table>
## Peers

<table>
<thead>
<tr>
<th>DMU</th>
<th>University</th>
<th>Score</th>
<th>SAT</th>
<th>TE</th>
<th>ACA</th>
<th>INS</th>
<th>SS</th>
<th>OP</th>
<th>BA</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>Fisk University</td>
<td>46.35%</td>
<td>0.3</td>
<td>0.56</td>
<td>0</td>
<td>0</td>
<td>0.14</td>
<td>0</td>
<td>0.46</td>
<td></td>
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<tr>
<td>80</td>
<td>FAMU</td>
<td>108.59%</td>
<td>0.42</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.08</td>
<td>0.5</td>
<td>1.09</td>
<td>1</td>
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<tr>
<td>81</td>
<td>Florida Memorial University</td>
<td>68.40%</td>
<td>0.52</td>
<td>0.27</td>
<td>0.11</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
<td>0.68</td>
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<tr>
<td>83</td>
<td>Fort Valley State University</td>
<td>63.37%</td>
<td>0.49</td>
<td>0.4</td>
<td>0</td>
<td>0</td>
<td>0.11</td>
<td>0</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>Grambling State University</td>
<td>77.93%</td>
<td>0.52</td>
<td>0.13</td>
<td>0.05</td>
<td>0.15</td>
<td>0.04</td>
<td>0.11</td>
<td>0.78</td>
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</tr>
<tr>
<td>96</td>
<td>Hampton University</td>
<td>93.44%</td>
<td>0.48</td>
<td>0.43</td>
<td>0.05</td>
<td>0</td>
<td>0.05</td>
<td>0</td>
<td>0.93</td>
<td>8</td>
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<tr>
<td>108</td>
<td>Jackson State University</td>
<td>70.86%</td>
<td>0.35</td>
<td>0</td>
<td>0.02</td>
<td>0.11</td>
<td>0.03</td>
<td>0.5</td>
<td>0.71</td>
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</tr>
<tr>
<td>110</td>
<td>Johnson C Smith University</td>
<td>60.34%</td>
<td>0.32</td>
<td>0.54</td>
<td>0</td>
<td>0</td>
<td>0.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Kentucky State University</td>
<td>40.55%</td>
<td>0.48</td>
<td>0.37</td>
<td>0.03</td>
<td>0.02</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Note: DMU stands for Degree Measures Unit.*
Efficiency Scores

Efficiency Score

Florida Agricultural and Mechanical University

Kentucky State University

Tennessee State University

Hampton University

Lincoln College
DEA Usefulness for HBCUs

• Existing Data allows HBCUs to learn from each other
  – Peer groupings are based on DEA weights, not on reputation or norms
  – Peer groupings likely have a similar resource structure

• Communicate successes to policy makers
  – Ex: Paul Quinn College

• Caution: Context still quite important
  – Lower performance scores not indicative necessarily of wrongdoing or mismanagement
  – Other constraints might be present
Past Lessons from Benchmarking with HBCUs

• HBCUs are typically outproduce their peers given the institutional resource constraints. The “doing more with less” axiom seems true

• Federal funding helps HBCU performance

• Reputational claims can be spurious
What now?

- Can HBCUs (and their departments) work with each other to lean from benchmarking and management science?

- DEA doesn’t open black box, but can suggest which black boxes to open

- DEA, and other management science techniques, might aid in HBCU planning and organizational learning