Lecture notes on Johnson and Turner, “Faculty Without Students”

What determines student/faculty ratios in different university departments? e.g., Economics at RU has 40+ students per faculty, Philosophy has approximately 8-10 students per faculty

“Economic model”: Allocate faculty to different departments so as to maximize “instructional output” subject to the university’s budget constraint. (More like a model of labor supply than of labor demand.)

Equivalently, hire faculty in different departments so as to equalize MR and MC: simplification: assume MR is the same for all departments (NB: some universities do have differential pricing by major) then, allocation of faculty to different departments would simply mean equalizing MC across departments

\[
MC = \Delta TC / \Delta Q \quad \Delta TC = W \times \Delta L \quad \text{so } MC = W \times \Delta L / \Delta Q = W/(\Delta Q/\Delta L)
\]

so equalizing MC would mean employing fewer faculty (L) in a department if \(W\) is high and/or if marginal product of faculty \(\Delta Q/\Delta L\) is low

Equivalently, equalize “marginal gains from instruction, per dollar spent on instruction”: equalize \((\Delta Q/\Delta L)/W\) across departments.
So, *ceteris paribus*, we expect a higher student/faculty ratio in disciplines with...

higher salaries (Economics vs. Philosophy?)

more favorable “production technology” (Economics vs. French?)

**Caveats:**
There are substitutes (close? imperfect?) for faculty – graduate students, adjuncts, etc.

Universities have other *objectives* besides maximizing learning subject to a budget constraint – e.g., research productivity, graduate-program output.

Universities also have additional *constraints* – e.g., the tenure system, minimum effective size, or economies of scale.

Data on actual enrollments may not accurately reflect student “demand” (e.g., distribution requirements, requirements for major).

Data on student/faculty ratios by discipline:

- enrollment in private research universities (e.g., Harvard) and
- small liberal arts colleges (e.g., Williams) has fallen over time
- so, *overall*, emphasis on arts and sciences has fallen,
  - emphasis on professional/vocational subjects has gone up
- enrollment of women has increased substantially, accompanied by
  - a shift away from “female” fields (English, languages, etc.)
  - and towards business, social sciences, life sciences

Student/faculty ratios have generally risen in private research u’s, have generally fallen in public u’s
Look at pattern of **adjustment**: econ salaries have gone up relative to other salaries, and so student/faculty ratio in econ has gone up too.

Cross-section regressions for departmental differences in student/faculty ratios (Table 2, p. 182):

*dependent variable = student/faculty ratio; standard error in parentheses*

<table>
<thead>
<tr>
<th>independent variable</th>
<th>all universities</th>
<th>public universities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty quality rank</td>
<td>-0.368 (0.097)</td>
<td>-0.384 (0.137)</td>
</tr>
<tr>
<td>Number of PhD recipients per year</td>
<td>-0.017 (0.007)</td>
<td>-0.029 (0.009)</td>
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</tbody>
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(Each regression also includes dummy variables for field and institution.)

But... couldn’t it be the other way around?
A “political economy” model of the student/faculty ratio

“...we suspect that differences across fields in the allocation of faculty relative to student demand persist even after accounting for relative salary, research preeminence, and pedagogical differences. This residual disparity might be the product of political forces within institutions that favor certain disciplines.” (p. 186)

Basic idea: political power within the university affects allocation of faculty – e.g., in corporations, “weak” divisions hold more cash “because executives have a lower opportunity cost of time and greater returns to internal lobbying to increase resources” – same could apply to university departments

Problem: high faculty salaries in some disciplines can “rationally” cause higher student-faculty ratio in those disciplines, but can also mean less inclination on the part of those faculty to engage in intra-university politics about allocating hires and money. Either way, student/faculty ratio will be high in those disciplines.

Thus, a given result is consistent with both theories.