Data in the Undergraduate Economics Curriculum: Old and New Practices

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Outline

- Introduction
- Problem
- Response
- Hands-on Examples
- Conclusions
Student Learning Goals

“Thinking like an economist”

Problem
Standard Curriculum

- Sequencing the Curriculum
  - Introductory course (x2)
  - Intermediate theory course (x2)
  - Upper division elective courses
  - Methods course
  - Capstone experience
Traditional View of Data
Traditional Work with Data
Model 2: Top 5% income share:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficient</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lagged top 5% income share</td>
<td>.842</td>
<td>.000***</td>
</tr>
<tr>
<td>Top marginal tax rate</td>
<td>-.013</td>
<td>.047**</td>
</tr>
<tr>
<td>GDP Growth</td>
<td>-.006</td>
<td>.868</td>
</tr>
<tr>
<td>GDP (2000$)</td>
<td>2.455E-013</td>
<td>.074*</td>
</tr>
<tr>
<td>Export + Imports</td>
<td>.018</td>
<td>.105</td>
</tr>
<tr>
<td>Private credit</td>
<td>.002</td>
<td>.535</td>
</tr>
</tbody>
</table>

R square: .96
Level of significance: *** 1% , ** 5% , * 10%

Data Description

<table>
<thead>
<tr>
<th>Data Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
</tr>
<tr>
<td>Interest rates</td>
</tr>
<tr>
<td>Growth Rate</td>
</tr>
<tr>
<td>Exp/GDP</td>
</tr>
<tr>
<td>FDI/GDP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Unemployment</th>
<th>Interest rates</th>
<th>Growth Rate</th>
<th>Exp/GDP</th>
<th>FDI/GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estonia</td>
<td>33.219(.957)</td>
<td>6.710(.473)</td>
<td>-2.830(.125)</td>
<td>5.424(.377)</td>
<td>.465(-.017)</td>
</tr>
<tr>
<td>Latvia</td>
<td>-1.765(.041)</td>
<td>.310(-.019)</td>
<td>-2.559(.102)</td>
<td>16.891(.858)</td>
<td>-.371(-.018)</td>
</tr>
<tr>
<td>Lithuania</td>
<td>23.355(.917)</td>
<td>9.518(.646)</td>
<td>-1.845(.048)</td>
<td>2.776(.123)</td>
<td>1.367(.017)</td>
</tr>
</tbody>
</table>
Student Work Suffers

Scores by Student Learning Goal and Subheading

<table>
<thead>
<tr>
<th>Subheading</th>
<th>Area</th>
<th>Assessment</th>
<th>Average Score</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Literature Review</td>
<td>Strong</td>
<td>5.05</td>
<td>1.21</td>
</tr>
<tr>
<td>3.2</td>
<td>Use of Theories</td>
<td></td>
<td>5.11</td>
<td>1.31</td>
</tr>
<tr>
<td>3.3</td>
<td>Empirical Methods</td>
<td>Strong</td>
<td>5.59</td>
<td>1.33</td>
</tr>
<tr>
<td>3.4</td>
<td>Figures and Tables</td>
<td></td>
<td>4.91</td>
<td>1.51</td>
</tr>
<tr>
<td>3.5</td>
<td>Interpretation</td>
<td></td>
<td>4.68</td>
<td>1.49</td>
</tr>
<tr>
<td>4.1</td>
<td>Organization</td>
<td></td>
<td>5.41</td>
<td>1.26</td>
</tr>
<tr>
<td>4.2</td>
<td>Oral Skills</td>
<td>Strong</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>4.3</td>
<td>Writing Skills</td>
<td></td>
<td>5.64</td>
<td>1.29</td>
</tr>
<tr>
<td>5.1</td>
<td>Research Question</td>
<td></td>
<td>5.45</td>
<td>1.41</td>
</tr>
<tr>
<td>5.2a</td>
<td>Mastery of Data</td>
<td>Strong</td>
<td>5.30</td>
<td>1.53</td>
</tr>
<tr>
<td>5.2b</td>
<td>Mastery of Methods</td>
<td></td>
<td>5.36</td>
<td>1.29</td>
</tr>
<tr>
<td>5.3</td>
<td>Conclusions</td>
<td></td>
<td>4.32</td>
<td>1.32</td>
</tr>
</tbody>
</table>
Response
The Activity

- Quantitative case studies
  - Data collection and analysis guided through discussion questions
  - Topics related to theoretical concepts and theories
Theoretical Foundation

- Bloom’s (1956) educational taxomomy
- Easton (1983) and Erskin et al. (1998) case method teaching pedagogy
Information Literacy Strategy

- Goad (2002):
  - Formulating a question
  - Pinpointing what you want to know
  - Organizing information
  - Planning a search
  - Evaluating the materials
Information Literacy Goals

- Shapiro and Hughes (1996):
  - Tool literacy
  - Resource literacy
  - Social-structure literacy
  - Research literacy
  - Publishing literacy
  - Emerging technology literacy
  - Critical literacy
Hands-On Example (I)
Money & Banking Topics (I)

- **Stock Prices**
- **Bond Prices**
  - Corporate Bond Risk Premium
  - Inflation Expectations
  - Nominal vs Real Interest Rates
- **Interest Rates**
  - The Term Spread
  - Sovereign Debt Risk Premiums
Money & Banking Topics (and II)

- **Exchange Rates**
  - Nominal vs. Real Exchange Rates
  - PPP Theory of ER Determination

- **Financial Derivatives**
  - The Interest Rate Swap Spread
Setup – Information Session
Setup – Theoretical Concept

- The Fisher Equation: $i = r + \pi$
  - $i$, nominal interest rate
  - $r$, real interest rate
  - $\pi$, inflation rate

- It follows: $r = i - \pi$

Setup – FRED Database

- https://research.stlouisfed.org/fred2/
  - Graph: FEDFUNDS
  - Add Data Series > Modify Existing Series
  - Type: CPI
  - Units: Continuously Compounded Rate of Change
  - Create Your Own Data Transformation: Formula : a-b > Apply
Setup – Discussion Questions

- **Real Interest Rates**
  - How does the real Federal Funds rate change in value during expansions? Why?
  - How does the real Federal Funds rate change in value during contractions? Why?
  - What does a negative real Federal Funds rate mean?
Hands-On Example (II)
Setup – Information Session
Intermediate Macro Topics (I)

- GDP Components
- Uses of Saving Identity
- Productivity and Unemployment
- Growth and Productivity
- Money Supply and Inflation
- Real Interest Rates
- The Phillips Curve
Setup – Theoretical Concept

- The Phillips Curve: $\pi = f (u)$
  - $\pi$, inflation rate
  - $u$, unemployment rate


Setup – FRED Database

- https://research.stlouisfed.org/fred2/
  - Graph: UNRATE
  - Select dates: 1990-01-01 / 2014-01-01
  - Frequency: Annual
  - Add New Series > CPI
  - Units: Continuously Compounded Rate of Change
  - Download Data > Open fedgraph.xls
Setup – MS Excel

- Open fedgraph.xls
  - Select: data under UNRATE and CPIAUCSL_CCH
  - Insert > Charts > Scatter (with line)
Setup – Discussion Questions

- The Phillips Curve
  - What is, generally speaking, the slope of the spaghetti line connecting all the data?
  - For which years does the Phillips Curve seem to “hold true”?
  - Why would the Phillips Curve shift?
  - What is the *natural rate of unemployment*?
Conclusions
Design Strategies

- Identify “quantifiable” topics
- Create out-of-class data retrieval and analysis exercises
- Involve librarians
- Create discussion questions based on the data
- Organize in-class open-ended discussions of student work
Student Reflections

- “I feel using real data to help support economic theories was extremely useful”
- “Learning how to analyze graphs and data and how to properly interpret that data were valuable skills to learn”
- “I have a better perspective on actual Economics, I feel better informed”
Instructor Reflections

- Student thinking becomes more sophisticated and context-rich
- More fluid application of economic theories and concepts
- More critical assessment of theories
- Topics and research ideas carry on to the capstone course
Thank You.

Questions?