



# Data in the Undergraduate Economics Curriculum: Old and New Practices

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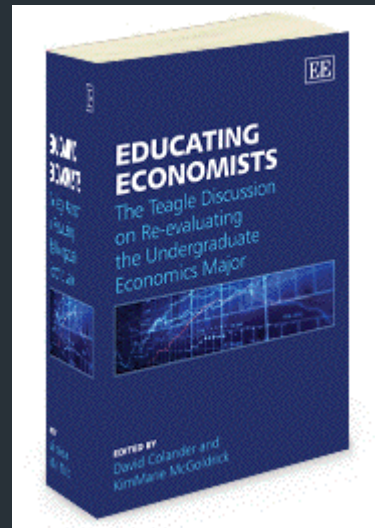
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# Outline



- Introduction
- Problem
- Response
- Hands-on Examples
- Conclusions

# Student Learning Goals



*“Thinking like an economist”*

*Siegfried, J., Bartlett, R., Hansen, L., (1991), The Status and Prospects of the Economics Major. Journal of Economic Education Vol. 251, No. 3, pp. 197-224*

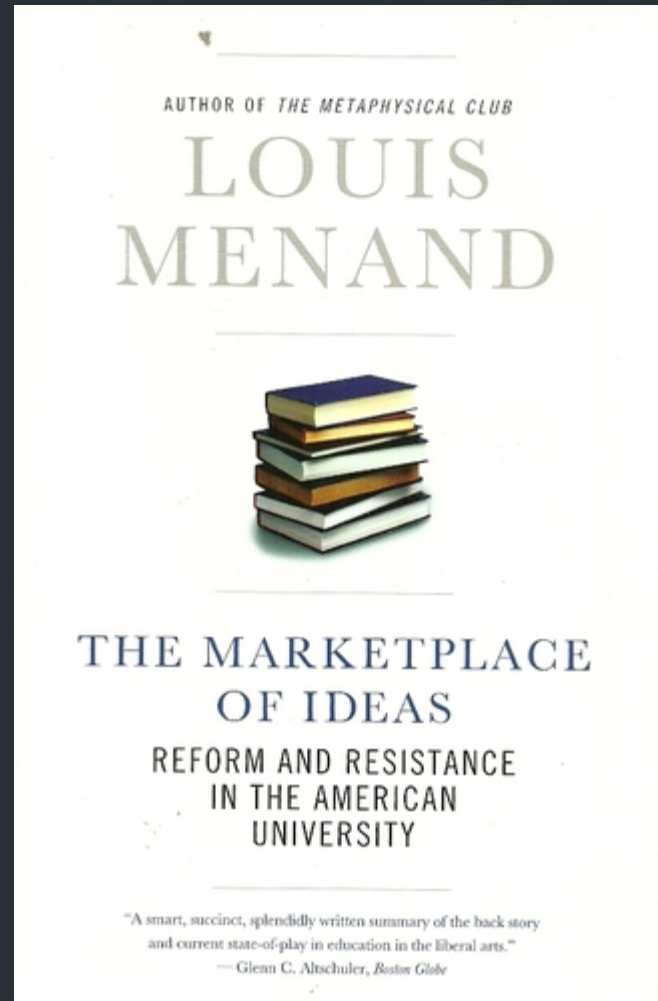
Problem



# Standard Curriculum



- Sequencing the Curriculum
  - Introductory course (x2)
  - Intermediate theory course (x2)
  - Upper division elective courses
  - Methods course
  - Capstone experience



Menand, L. (2001 and 2010) *The Marketplace of Ideas: Reform and Resistance in the American University*. W. W. Norton & Company, NY.

# Traditional View of Data

The screenshot displays the IMF Data Cross-Dataset Query Builder interface. The top navigation bar includes links for IMF.org, eLIBRARY, BOOKSTORE, IMF DATA, and Help. The main interface is divided into several sections:

- Left Panel:** Contains filters for Country (1 of 347 items selected), Concept (0 of 2002 items selected), Data Source (1 of 13 items selected), and Time (1990 - 2013 (Annual)). Each filter has a 'Reset' button. At the bottom of this panel are 'Download' and 'View data →' buttons.
- Available items:** A tabbed section with 'Selected items' and 'Get direct link' options. It features a 'Concept' header and a 'Show elements as' dropdown menu set to 'Label'. Below this is a 'Quick filter:' search box.
- Actions:** A row of icons for 'Expand All', 'Select All', 'Select Branch', 'Select Siblings', 'Collapse All', 'Deselect All', 'Deselect Branch', and 'Deselect Siblings'.
- Tree View:** A hierarchical tree of economic indicators. The root is 'National Accounts', which is expanded to show 'Expenditures' and 'Real' categories. Under 'Expenditures', 'Nominal' is expanded to show 'Gross Domestic Product, Nominal', 'Final Consumption Expend., Nominal', and 'Gross Capital Formation, Nominal'. Under 'Real', 'Deflator' is expanded to show 'Income, Savings, and Investment' and 'GDP-GNP Relation'. Other categories like 'Indicators of Economic Activity', 'Labor Markets', 'Prices', 'Government and Public Sector Finance', 'Financial Indicators', 'Balance of Payments', 'International Investment Position', 'International Reserves', 'Fund Accounts', 'External Trade', and 'Exchange Rates' are also listed.

# Traditional Work with Data

The screenshot displays the EViews software interface. The main window is titled "EViews" and contains a menu bar with "File", "Edit", "Object", "View", "Proc", "Quick", "Options", "Add-ins", "Window", and "Help". Below the menu bar is a toolbar with icons for "View", "Proc", "Object", "Print", "Save", "Details+/-", "Show", "Fetch", "Store", "Delete", "Gener", and "Sample". The main area shows a workfile named "Workfile: SENIOR SEM JDOE - (g:\my document...". The workfile range is "1/03/2000 12/27/2010 -- 574 obs" and the sample is "1/03/2000 12/27/2010 -- 574 obs". A list of objects is displayed, including "adj\_close", "c", "close", "d2", "direc", "dlog\_close", "dlog\_low", "dlog\_phl", "dlog\_poc", "dlog\_volume", "dprice", "dum\_2001", "dum\_2008", "dum\_2010", "high", "log\_close", "log\_low", "log\_phl", "log\_poc", "log\_volume", "low", "open", "phl", "phl\_gr", "phl\_vol", "poc", "poc\_gr", "poc\_vol", "resid", "t", "td2", "volume", "volume\_g01", "volume\_g02", "volume\_g03", "volume\_g04", "volume\_gr", "volume\_movav12", "volume\_t01", "volume\_t02", "volume\_t03", "volume\_trend", and "volume\_trends". The status bar at the bottom shows "Untitled" and "New Page".

EViews

File Edit Object View Proc Quick Options Add-ins Window Help

Workfile: SENIOR SEM JDOE - (g:\my document... - □ ×

View Proc Object Print Save Details+/- Show Fetch Store Delete Gener Sample

Range: 1/03/2000 12/27/2010 -- 574 obs Filter: \*  
Sample: 1/03/2000 12/27/2010 -- 574 obs

<input checked="" type="checkbox"/> adj_close	<input checked="" type="checkbox"/> phl_gr
<input checked="" type="checkbox"/> c	<input checked="" type="checkbox"/> phl_vol
<input checked="" type="checkbox"/> close	<input checked="" type="checkbox"/> poc
<input checked="" type="checkbox"/> d2	<input checked="" type="checkbox"/> poc_gr
<input checked="" type="checkbox"/> direc	<input checked="" type="checkbox"/> poc_vol
<input checked="" type="checkbox"/> dlog_close	<input checked="" type="checkbox"/> resid
<input checked="" type="checkbox"/> dlog_low	<input checked="" type="checkbox"/> t
<input checked="" type="checkbox"/> dlog_phl	<input checked="" type="checkbox"/> td2
<input checked="" type="checkbox"/> dlog_poc	<input checked="" type="checkbox"/> volume
<input checked="" type="checkbox"/> dlog_volume	<input checked="" type="checkbox"/> volume_g01
<input checked="" type="checkbox"/> dprice	<input checked="" type="checkbox"/> volume_g02
<input checked="" type="checkbox"/> dum_2001	<input checked="" type="checkbox"/> volume_g03
<input checked="" type="checkbox"/> dum_2008	<input checked="" type="checkbox"/> volume_g04
<input checked="" type="checkbox"/> dum_2010	<input checked="" type="checkbox"/> volume_gr
<input checked="" type="checkbox"/> high	<input checked="" type="checkbox"/> volume_movav12
<input checked="" type="checkbox"/> log_close	<input checked="" type="checkbox"/> volume_t01
<input checked="" type="checkbox"/> log_low	<input checked="" type="checkbox"/> volume_t02
<input checked="" type="checkbox"/> log_phl	<input checked="" type="checkbox"/> volume_t03
<input checked="" type="checkbox"/> log_poc	<input checked="" type="checkbox"/> volume_trend
<input checked="" type="checkbox"/> log_volume	<input checked="" type="checkbox"/> volume_trends
<input checked="" type="checkbox"/> low	
<input checked="" type="checkbox"/> open	
<input checked="" type="checkbox"/> phl	

← > Untitled New Page



# Weak Output

## Data Description

	Unemployment	Interest rates	Growth Rate	Exp/GDP	FDI/GDP
Estonia	33.219(.957)	6.710(.473)	-2.830(.125)	5.424(.377)	.465(-.017)
Latvia	-1.765(.041)	.310(-.019)	-2.559(.102)	16.891(.858)	-.371(-.018)
Lithuania	23.355(.917)	9.518(.646)	-1.845(.048)	2.776(.123)	1.367(.017)

### Model 2: Top 5% income share:

Variable	Unstandardized Coefficient	Significance Level
Lagged top 5% income share	.842	.000***
Top marginal tax rate	-.013	.047**
GDP Growth	-.006	.868
GDP (2000\$)	2.455E-013	.074*
Export + Imports	.018	.105
Private credit	.002	.535
R square: .96		
Level of significance: *** 1% , ** 5% , * 10%		

Data Analysis

# Student Work Suffers

**Scores by Student Learning Goal and Subheading**  
**N = 22**

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

# 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 taxonomy
- 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:  $r = i - \pi$

Fisher I. 1930. *The Theory of Interest*. New York: A. M. Kelly

# 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

Phillips (1958). “The Relation Between Unemployment and the Rate of Change of Money Wages in the United Kingdom, 1861-1957” *Economica* 25(100), pp. 283-99.

Samuelson and Solow (1960). “Analytical Aspects of Anti-Inflation Policy” *American Economic Review Papers and Proceedings* 50(2), pp. 177-94.

# 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?

