

Proposal (due 29 Mar)

- **Dependent Variable** - what will be explained
- **Independent Variables** - data to assemble
 - Define it
 - Report the source for the data
 - Describe hypothesis that will be tested with the variable
- **Written Proposal** - 15 copies due one class session prior to presentation

Theory-Test Paradigm

Positive Economics - "what is"; trying to explain the world; welfare analysis (normative) is irrelevant

Min Wage Example - minimum wage on labor market; two testable predictions: lower employment and more unemployment... both are testable

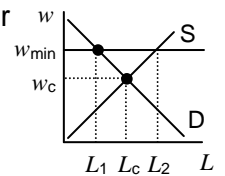
- 1) # workers L_c to L_1 (so $L \downarrow$)
- 2) excess supply of workers: $L_S - L_D$: 0 to $L_2 - L_1$

Untestable Models - conclusions can't be observed

Equilibrium - can't prove existence

Multiple Equilibria - can't get prediction of which will occur

** If theory can't be tested, it's not an example of positive economics **



Theoretical Economics - tautological; exercise in verbal or mathematical logic; predictions are a product of the assumptions; conclusions could be correct based on the assumptions, but may not be empirically correct (i.e., reflect real world); mathematical correctness does not imply relevance

Good Theory - must have testable predictions & predictions must be verified

Redo - if theory's predictions are rejected with sound empirical test, must redo the theory to be consistent with the evidence

Gravity Example - simple gravity equation may explain steel ball falling, but to explain other objects (like a feather), need more sophisticated theory incorporating aerodynamics

Trash It - "Empirically irrelevant theories must be discarded!"

Phillips' Curve Example - part of theory that said long-run tradeoff between inflation and unemployment was proven incorrect; now we only talk about short-run tradeoff

Strong Theory - if model's predictions are verified, model is supported; as more evidence amasses and supports the predictions, the model gains more acceptance

Sensitivity of Results - does model perform well in unusual settings: Great Depression, hyperinflation, distant past, rich vs. poor countries; rich vs. poor households, high IQ... good theories often result from searching for explanations of unusual/surprising facts

Time Series - changing sample period usually changes results

Distinguish Between Models - if two models have same predictions, need to find where they have different implications to decide which is correct (or better)

Morton: *Methods and Models*

Complete Data Generating Process (DGP) - model purport to explain everything (e.g., consumer demand subject to budget constraint; production function)

Empirical Testing - straightforward; completely dictated by the theory

Problems - may not have all the data; time series data doesn't capture it all (e.g., quarterly prices over 30-year period... only 120 data points... not enough degrees of freedom to analyze everything)

Deterministic - if model has no stochastic component, noise in outcomes guarantees rejection... see part 2d below

Partial DGP - model addresses only part of the picture; doesn't claim to cover everything (e.g., model explains effects of income on private school decision ignoring other factors [religion, proximity, etc.]... from Tiebout (*tee-bo*) model where demand for private school results from heterogeneity within community on desired school quality; if single school district, it's unlikely to provide level of schooling everyone wants; multiple districts would make it less likely to have demand for private schools)

Partial DGP model doesn't account for everything so there are three options for dealing with the real world

1. **Produce More Comprehensive Model** - could include other factors (e.g., religion... for people who want kids taught a certain way)... problem: temptation to keep tinkering with the model to explain everything and never get around to testing... postpones empirical feedback on model's basic predictions (also very costly to create new model for each empirical study)
2. **Assume Model is Complete** - ignores other factors; criticism of this option is that it ignores other variables that explain behavior; if these variables are correlated with other independent variables, they're incorporated in the error term so the error is correlated to independent variables which makes coefficients biased;

Responses:

- a. if we can prove omitted variables that are not significant or not correlated to other independent variables, it's OK to omit them
 - b. even if omitted variables are important, results may show where model is weak
 - c. can use experimental study to reduce outside influences (i.e., omitted variables), but value depends on how well experiment mimics real world
 - d. add stochastic component to deal with aspects not accounted for by model; allows statistical testing of complete DGP that isn't doomed to failure, but mathematically difficult so viable only for simple settings
- Centipede Game** - theory predicts first player takes initial earnings, but this only occurs 8% of the time in experiments... p.20
- McKelvey & Palfrey** - propose **quantal response equilibrium (QRE)**;
players likely to choose better strategy, but not with probability 1... this stochastic model fits data better than deterministic model
3. **Assume Partial GDP and Control for Other Factors** - example from school model: add variable to account for religion (% Catholics in school district)... let reasonable intuition to guide selection of auxiliary variables (not really spelled out in theory)
- Estimation Procedure** - regression usually adds assumptions that aren't in model (e.g., linearity, normality)... these additional assumptions could cause model to fail empirical test (e.g., simple regression imposes linear demand which could cause theory to fail because it doesn't agree with data, but adapting regression for log-linear demand may accurately reflect data)

Interpretation of Error Term - could reflect many things: stochastic model (traditional error), omitted variables (error picks up effect of these variables), measurement error

Other Considerations -

Best Variable - want as close as possible to theory's variable

Example - voter turnout = $f(\text{expected closeness of election})$... turnout based on how likely potential voter is to make a difference in the election; more likely to make difference if race is close; likely variable: polling data prior to election, although some studies use actual election results if polling not available (not exactly accurate because this may not reflect expected closeness)

Example - # in private school = $f(\# \text{ with income} \gg \text{median income})$... could use standard deviation, but better measure would be # with income twice as much as median (only worried about upper tail)

Example - reelection = $f(|\text{candidate position} - \text{median voter position}|)$... candidate further from median voter is less likely to get reelected; how measure... use polling data to estimate level of liberal/conservative for candidates and median voter

Example - Lame duck (limited to two terms so less likely to please median voter in final term (but prior to final term, more likely to mirror median voter in order to get reelected))... when does someone become a lame duck? Even if final term, may still be worried about future political career; also, incumbent may not have decided until required to file as candidate \therefore need to compare fall of last term in office with fall of term when seeking reelection... how to measure difference: use scoring from various groups that track politicians (usually based on liberal-conservative dimension on how congressmen votes relative to organization's preference)

Sensitivity of Results - several measures of same variable often available; how do results change if using different measures (e.g., CPI vs. GDP deflator; different savings rates; different types of income, different interest rates [30-year bond, 10-year bond, savings accounts, etc.]

Level of Aggregation - individual data best to test individual theory, but aggregate data may provide greater coverage (e.g., survey data with 1500 observations has very few observations in many states \therefore harder to estimate effects of state policies); if prediction is about market, use market-level data; if theory has implications about state policies chosen, compare policies across states

Pitfalls in Empirical Analysis

Data & Reporting Accuracy - garbage in = garbage out; important to check data for entry errors; check data coding if you have original data; if you don't have original data, check for obvious errors (e.g., 50 years of schooling, 4 year old in labor force, etc.); data compiled by others often have errors

Internal Consistency - some survey answers are inconsistent (e.g., answer no to giving merit raises, but then specify what the merit raise is; or answer 16 years of school, but enter age 11)

Check regression table (in paper) against original regression (on computer screen)... look for typos

Specification - purpose of empirical analysis is to test economic theory

Complete DGP - model completely specifies data constructs needed

Partial DGP - model and auxiliary hypotheses give data constructs (e.g., from Tiebout model: model specifies income measure and auxiliary hypothesis specifies how to measure effect of religion)

Variables to test auxiliary hypotheses cannot be inconsistent with model (e.g., from Tiebout model, demand comes from unsatisfied demand so it reflects

heterogeneity in income; auxiliary hypothesis that there will be more private schools in more wealthy communities is contradictory)

How Should Regression Analysis Proceed

1. Estimate regression with all theoretical constructs implied by theory and auxiliary hypotheses... no other variables should be in regression; this allows you to test each hypothesis
2. **Specification search** - can change functional form (log-log, linear-linear, etc.) or alternative measures for variables (e.g., family income, male income, permanent income)

Multicollinearity - rationale for specification search if 2 variables are highly correlated (e.g., male income and female income.. or father's education and mother's education... impossible to separate effect of each variable)... solution run separate regressions: 1 using both (for comparison), 1 using male, 1 using female... report regression with most reasonable results

Leamer - suggests following the Bayesian strategy (**Bayesian Updating**... start with some estimate of distribution; over time, new information comes in so use weighted average of initial belief and new information)

Economic Theory - set of "certain" variables that must be in regression (e.g., if estimating demand for gasoline, must have price of gasoline and real income in regression)

"Doubtful" Variables - could keep/delete (may correspond to less important auxiliary hypotheses)

Search - over various combinations of doubtful variations report results most favorable to theory

Problem - disagreement in empirical research often reflects differences in specification; if results reports are "most favorable" results, then usual significance levels are biased towards significance

Solution - Leamer recommends reporting range of results from various specifications; robustness search provides evidence on fragility of results

Robustness - focuses on specification [variables included and functional form], sample period, and data set

Reasonable Specification - must test reasonable economic hypotheses; rule out poor specifications that test bad theories

Kenny's Recommendation - think long and hard about hypotheses before running regression; minimize set of doubtful variables

Stepwise Regress - progressively drop variables that are insignificant

Problem - results in an empirical specification that does not test model; this is terrible empirical analysis (specification should include all variables specified by the theory)

In Practice - McCloskey & Ziliak (*Journal of Economic Literature*, Mar 1996) 32% admitted some stepwise procedure

Unexpected Results -

Bayesian Reaction - check specification of regressions; run variants until get expected result; this explains why it takes time for accepted theory to be overturned by new evidence; should accept unexpected results if empirical test is valid

ID Important Variables - several ways to identify

Statistical Significance

Sizeable Impact on dependent variable

Dummy Variable - typically coded 0, 1 (e.g., MARRIED = 1 if married; 0 if not)

Continuous Variable - wide range in values; standard deviation measures typical deviation from variable mean (typical variation in variable) ∴ reasonable measure of typical effect for variable is regression coefficient times standard deviation

Significance - statistical vs. economic; e.g. purchasing power parity is within 0.01% of 1 (but statistically different from 1) is still economically significant

Mayer: Truth vs. Precision in Economics

"The computer revolution has, I believe, induced economists to carry reliance on mathematics and econometrics beyond the point of vanishing returns." (Milton Friedman)

Soft Test - take truth of hypothesis as given and question data or specification if results contradict the hypothesis; this is only valid if using a highly confirmed hypothesis and you're trying to establish what data set is the appropriate one to use in forecasting with that hypothesis

Hard Test - used to determine the validity of a hypothesis

Right Way Round - have to worry about both Type I and Type II errors; we rightly give benefit of the doubt to the null hypothesis, but we have to be careful what we set up as the null... "when someone writes that his or her hypothesis is confirmed, that merely means that it is not strongly disconfirmed"

Statistical vs. Substantive Significance - if purchasing power parity holds within, say, 0.01 percent, we don't reject the theory of purchasing power parity even if this 0.01 percent were statistically significant because our sample is extremely large... need to define the sense in which the hypothesis is approximately correct

Statistical Hypothesis - merely implies that x has some effect on y

Economic Hypothesis - usually imply much more (e.g., x is a major cause of y)

Compound Hypotheses - usually misused... if three steps at 97%, 96% and 95%, the overall significance is only 88%!

Reporting the Results -

"In principle, few would disagree that in hard testing a scientist should not urn, say thirty different but equally reliable experiments and then report only the one that confirms the hypothesis, while keeping silent about those that disconfirm it."

"If you are doing an experiment, you should report everything that you think might make it invalid--not only what you think is right about it." (Richard Feynman, Nobel Laureate in physics)

"The researcher has the motive and opportunity to present his results selectively, and the reader, knowing this, imputes a low or zero signal-to-noise ratio to the reported results."

"If only their positive results achieve publication, the outcome is a communal data mining that may cause an invalid hypothesis to be accepted"

Robustness - going out of one's way to look for trouble; start with Leamer's Bayesian approach; tests should look for: (a) omitted variables, (b) various lags, (c) alternative functional forms, (d) different data sets (e.g., several countries or multiple data sets for same country), (e) sample period (e.g., drop single year from time series)

"Techniques for dealing with outliers and dominant observations are available, but even highly effective techniques do not improve the quality of research if they are not used."

Replications - "one reason replications are relatively scarce is that such work is not highly regarded. It is considered something which anyone can do, and in the ethos of our profession what is easy is not worth doing"

Check Data - check to key punching on own data; check computations; check data from computer output to tables in report

McCloskey & Ziliak: *The Standard Error of Regressions*

Statistical vs. Substantive Significance

Everyday - significant means of practical importance

Statistical - significant means signifying a characteristic of the population from which the sample is drawn

Power - can only be discussed relative to an explicit alternative hypothesis, making power analysis difficult for some of the alternatives

Summary - surveyed papers from American Economics Review from 1980s

70% didn't distinguish statistical significance from economic, policy or scientific significance

69% didn't report descriptive statistics (e.g., means of regression variables) that would allow reader to make a judgment about the economic significance of the results

(More findings quoted in next section)

Survey

Question	#	% Yes
1. Does the paper use a small number of observations, such that statistically significant differences are not found at the conventional levels merely by choosing a large number of observations?	182	85.7
2. Are the units and descriptive statistics for all regression variables included	178	32.4
3. Are coefficients reported in elasticity form, or in some interpretable form	173	66.5
4. Are the proper null hypotheses specified?	180	97.3
5. Are coefficients carefully interpreted? (e.g., pay attention to details of units of measurement and limitations of data)	181	44.5
6. Does the paper eschew reporting all t- or F-statistics or standard errors, regardless of whether a significance test is appropriate?	181	8.3
7. Is statistical significance at the first use, commonly the scientific crescendo of the paper [i.e., what author considers crucial test], the only criterion of "importance"?	182	47.3
8. Does the paper mention the power of the tests?	182	4.4
9. If the paper mentions power, does it do anything about it?	12	16.7
10. Does the paper eschew "asterisk econometrics" (ranking coefficients according to the absolute size of t-statistics)?	182	74.7
11. Does the paper eschew "sign econometrics" (commenting on sign but not the size of coefficients)?	181	46.7
12. Does the paper discuss the size of the coefficients?	182	80.2
13. Does the paper discuss the scientific conversation within which a coefficient would be judged "large" or "small"?	181	28
14. Does the paper avoid choosing variables for inclusion solely on the	180	68.1

basis of statistical significance?		
15. After the crescendo, does the paper avoid using statistical significance as the criterion of importance?	182	40.7
16. Is statistical significance decisive, the conversation stopper, conveying the sense of an ending?	182	29.7
17. Does the paper ever use a simulation (as against a use of the regression as an input into further argument) to determine whether the coefficients are reasonable?	179	13.2
18. In the "conclusions" and "implications" sections, is statistical significance kept separate from economic, policy, and scientific significance?	181	30.1
19. Does the paper avoid using the word "significance" in ambiguous ways, meaning "statistically significant" in one sentence and "large enough to matter for policy or science" in another?	180	41.2

Structure of Empirical Articles

Wyrick: *The Economist's Handbook: A Research and Writing Guide*

Key Elements -

Definition of Topic - more specific the better (simplifies task of deciding which economic theory to use); be clear on what you intend to accomplish (and what you don't intend to address)

Review of Other Work - reviewing related literature will inform readers about evidence contrary to your findings or show them that your findings reinforce with those of other specialists

Application of Economic Theory - explicitly name (e.g., supply and demand; marginal productivity theory of wages, etc.)

Hypothesis - statement of implications or predictions of economic analysis

Test of Hypothesis - combines data or other evidence and statistical testing or estimating method (usually regression)

Discussion of Results - are they consistent with or contrary to the hypothesis

Outline of Empirical Report - conceptually divided into four main parts that touch on each of the key elements above

I. Introduction - introduce and define the subject, including a discussion of what other researchers have contributed in this area and a brief statement about the findings of the present study

Clearly Defined Purpose - make sure reader is always aware of it; helps keep the report on track; how does this paper (a) push frontier out, (b) fix problems in literature, (c) fill in gaps; why is paper's contribution interesting and important? provide glimpse of empirical findings

Avoid Subtleties - inform reader of every major development leading up to the findings

Main Findings - describe main findings of the investigation; don't promise more than the study produces

Key Concepts - introduce and define key concepts and mention their relationships to other concepts if those relationships will be used later in the report

Tie Paper to Literature - review of related research; where is frontier of knowledge? look at papers on (a) same problem or issue, (b) related to the theory you plan to use, or (c) employing the same empirical methods

Citations - include author, issue he or she investigated, findings of the study

Tools at UF:

UF Library Website - quick links; "E"; Econlit... good database to search econ journals; can search by author, by subject or by title

Web of Science - full search

General Search - good for searching non-econ lit in social science

Cited Reference Search - if you have good article and want to check what's new since then, can look up all articles that cited the one you have

Keep Notebook - thoughts on future research topics based on where literature is flawed or incomplete

II. Economic Analysis - conduct an economic analysis of the problem and state the hypothesis suggested by economic theorizing

Roadmap - being theoretical section by stating what will be demonstrated in the analysis; develop a deductive argument that reasons from generally accepted principles and relationships to specific conclusions

Clarity - define terms that might confuse the reader; explicitly mention assumptions about key variables (concepts); define symbols when mathematical notation is introduced

III. Empirical Analysis - discuss how the hypothesis could be tested, test the hypothesis, and discuss the results of the test

Roadmap- inform reader about purpose of the statistical exercises (reiterate hypothesis from theory passage); identify (name) the statistical method you intend to use and explain why you believe this approach is the appropriate one to test the hypothesis

Sample - identify source of data (e.g., 50 states in 1992; National Longitudinal Survey of Youth: 1968-96; Annual data for U.S. 1955-96)

Justify Sample - best data set to test main hypotheses; why not extended (e.g., variable doesn't exist prior to 1955)... also have to identify and explain proxy variables (if 2 proxies are available, test the hypothesis twice (once with each proxy) to determine how robust the results are)

Describe Variable Sources & Creation - use variable names that are informative (they don't need to be your Stata variable names); e.g., median family income in 1982-1984 dollars; how well do variables match theoretical constructs (tie to prior literature);

Descriptive Statistics - provide them; can be helpful in interpreting results (McCloskey & Ziliak... only 31% reported descriptive stats)

Statistical Method - must justify method used (OLS, 2SLS, etc.)

Dealing with Problems - identify what problems were found and how they were dealt with (e.g., multicollinearity, heteroskedasticity)... if no notable problems are encountered, state that diagnostic tests were performed and no problems were detected

Discuss Results - include careful interpretation of the coefficients (e.g., does sign on coefficient support hypothesis; are variables statistically significant; impact of variable (economic significance))

Economic Significance - McCloskey & Ziliak... only 41% of 1980s papers in AER avoided ambiguity over significance (statistical or economic)

Tie To Prior Literature - McCloskey & Ziliak... only 28% of 1980s papers in AER do

Other Regressions - don't need to get into full details, but should provide overview of their findings

Impact - standard deviation times coefficient

Reasonable - magnitude of impact of variable could be too small or large if there's multicollinearity or omitted variable

Key Results - papers that focus on key results and don't report other results are poor form; evidence on other hypotheses provides information about problems with specification

IV. Conclusion - summarize the study's findings and explain how the study contributes to economic understanding

Summary - fast-paced commentary of theoretical argument and empirical evidence developed more fully in body of the report

Findings - what are more important results? what do we know that we didn't know before? what are implications of findings (why are they important)?

Future - what puzzles/opportunities left for future research?

Style Issues - deal with casual (i.e., lazy) reader; minimize effort required of reader, remind reader what you did earlier, tell reader where you're going, keep paper focused

Title - must summarize paper effectively: often used to determine whether paper is read

No Buzz Words - don't use phrases that sound good but do poor job of communicating the nature of the study's findings

Try to Include - indicate limits of the contribution (e.g. service sector vs. manufacturing or construction); hint at theoretic or statistical methods used (e.g. "neoclassical", "regressions", or "mathematical")

Analyzing Papers

Questions to guide your readings of assigned papers:

1. What is paper's contribution?
 - How does it push out frontier of knowledge?
 - What do we know that we did not know before?
 - Is this important or minor? Why?
2. What is sample?
 - Is sample appropriate or optimal for study?
3. Do variables correspond well to they theory?
4. Does paper do a good job of testing theory?
 - Is test creative?
 - Are there serious flaws?
 - How can the empirical work be improved?

Milyo & Waldfogel: *The Effect of Price Advertising on Prices: Evidence in the Wake of 44 Liquormart*

1. What is paper's contribution?

How does it push out frontier of knowledge?

2 Views of Advertising & Prices

Stigler (1961)... advertising reduces cost of consumer search so price has lower mean & variance; when information is free demand curve for firm is perfectly horizontal

Salop & Stiglitz (1977)... heterogeneity among consumers so price advertising may affect different firms' demand curves differently so Stigler's proposition may not hold (i.e., prices may not have lower mean &/or variance)

Benham (1972)... advertising associated with lower prices by comparing jurisdictions that forbid advertising to those that permit it... ignore possible endogeneity of regulations & don't control for omitted firm-specific or market-specific factors

Usual... cross-sectional data requires strong assumption (advertising restrictions are exogenous to prices)

Glazer (1981)... exogenous advertising on grocery prices because of newspaper strike; stores that stop advertising raise prices; only includes commonly advertised produce and meat products

Advertising has no effect on prices of advertised products at smaller stores that don't normally advertise... didn't study prices of goods store didn't advertise

Milyo & Waldfogel... use exogenous change in price advertising; looks at products that are and are not commonly advertised

What do we know that we did not know before?

Look at...

Advertising effect on price of advertised products at stores that do & don't advertise

Advertising effect on average prices (and margins) of products at advertising stores, regardless of whether products are advertised

Advertising effect on stores nonadvertising stores

Is this important or minor? Why?

Supports Lawson's claim "everybody in the courtroom knew that in reality the [price advertising] ban was a way of helping liquor dealers fix prices."

2. What is sample?

Is sample appropriate or optimal for study?

Unique because they started a year before the price advertising ban was ruled unconstitutional

Controls

retail price data for MA

wholesale liquor prices in RI and MA

Proxy... sales of RI lottery tickets

3. Do variables correspond well to their theory?

Product dummies, time dummies, and two mutually exclusive dummies indicating whether and how a store chooses eventually to advertise... doesn't really present theory or why these are used

4. Does paper do a good job of testing theory?

Is test creative?

Dealing with endogeneity problem; started collecting data 1 year before Supreme Court Ruling

Are there serious flaws?

Doesn't clearly cover statistical technique... have no clue where their results come from
Too many fixed effects (see #4 below)

Signs... could be local zoning issues on size/placement of signs

"subsequent price changes in both states undermine the assumption of stable prices in the absence of the change in the law"

Assumption... stores pay attention to competitor's prices & advertising

Ignores seasonality

Ignore price matching policies

Didn't address taxes (any changes to explain difference in prices between states)

How can the empirical work be improved?

1. The authors criticize OLS cross sectional studies of the effect of restricting advertising.

a) What is the problem with these studies?

Coefficients on advertising may be biased because decision at state level on whether to allow advertising may reflect some endogeneity; prior studies compare states that allow advertising with those that don't allow it (but don't have chance to look at before and after advertising regulation in same state... that's what Milyo & Waldfogel do)

b) How does this affect the estimated coefficients in the OLS studies?

Short Version - endogeneity problem (missing variable) means we could have regressors correlated to error term so parameter estimates are not consistent (biased)

Long Version -

$$P_L = \beta_0 + \beta_1 \text{Income} + \beta_2 \text{Ads} + \beta_3 \% \text{Baptist}$$

Price of alcohol as function of income, ability to advertise (1 = yes; 0 = no); & %Baptist

$$P_L = \beta_0' + \beta_1' \text{Income} + \beta_2' \text{Ads}$$

From first equation $\% \text{Baptist} = b_0 + b_1 \text{Income} + b_2 \text{Ads}$

Can show that $\beta_2' = \beta_2 + \beta_3 \cdot b_2$

Expect $\beta_3 < 0$ (more Baptists \Rightarrow less demand for alcohol)

Expect $b_2 < 0$ (more Baptists \Rightarrow less likely to have Ads)

Because we omitted "taste" variable (%Baptist) in second equation, have positive bias for β_2' ... if we expect $\beta_2 < 0$, excluding %Baptist makes Ads less effective ($|\beta_2'| < |\beta_2|$)

c) Is this problem avoided in the Milyo and Waldfogel paper? Explain.

Supreme Court ruling allowed them to control the endogeneity problem (RI had nothing to do with ruling); had data before and after ruling

Expensive and risky data collection... started 1 year before the Court ruling

2. Sample

a) How many observations? 6480... total of 540 store visits

b) Based on how many alcoholic products? 33 from 115 stores

c) Based on how many time periods? Jun 1995 and Jun 1997, quarterly (8 total periods)

d) Based on how many liquor stores in MA? RI? 58 in RI & 57 in MA

3. Were high or low price stores more likely to advertise after the ban was lifted?

Low-Price stores advertise... signs (5.6% lower) and newspaper (7.7% lower) prior to ads

4. A fixed effect is a dummy variable that captures whether the criterion is satisfied. There are 2 sets of product and state/store fixed effects used in the regression:

1) product fixed effects along with store fixed effects, or

2) store-product fixed effects

Given an example of (a) a product fixed effect, (b) a store fixed effect, and (c) a store-product fixed effect.

Fixed Effect - dummy variable (0, 1) that changes intercept

Product fixed effect... 32 dummies to denote which product is being looked at

Store fixed effect... 114 dummies to denote which store the product comes from

Store-product fixed effect... specific product bought at specific store

Time fixed effect... captures Supreme Court ruling (denotes before/after ruling)

Problem - too many fixed effects; could have very few observations for any individual fixed effect... may not be valid results

5. Did allowing liquor stores in RI to advertise liquor price have an effect on the price or the markup on average?

Overall: -0.51 and -0.73... neither statistically significantly different from zero

6. Did allowing liquor stores in RI to advertise liquor price have an effect on the price or the markup

a) for stores that did not advertise? no change ("nonadvertising store effect")

b) for stores that advertised some other product? no change ("advertising store effect")

c) for stores that advertised that product? 20% lower ("advertised product effect")

7. Does advertising by a rival affect the price a store charges

- a) if the store is advertising the same product? [yes \(lower price, 14%\)](#)
- b) if the store is advertising some other product? [yes \(lower price, 3%\)](#)
- c) if the store is not advertising? [no](#)

8. Are the effects of rival advertising greater if the rival is closer? [closer](#)

- a) Is this sensible? [yes](#)
- b) What does this imply about the nature of competition? [regional \(within few miles\)](#)

Abel: *Entry Into Regulated Monopoly Markets: The Development of a Competitive Fringe in the Local Telephone Industry*

1. What is paper's contribution?

How does it push out frontier of knowledge?

Telecommunications Act of 1996 - removed explicit state and local regulatory barriers to entry that protected incumbent **local exchange carriers** (ILECs)

Incentive Regulation - "banded rate of return, earnings sharing, price caps, or complete deregulation" p.291 (???)

Price Cap regulation - believed to mitigate inefficiencies associated with traditional rate-of-return regulation by providing flexibility and competitive incentives to regulated monopoly firms

** "often the industry itself that requested price cap regulation rather than it being forced on them... suggest that the incumbent firms believed they could gain from the adoption of price cap regulation."

Local access and transport areas (LATA)

What do we know that we did not know before?

Other studies used aggregation of several industries... didn't capture characteristics of specific industry behavior (or regulation)

Tied regulation to "political economy" (public choice)

Price cap regulation actually makes it less likely to have new entrants and results in larger regulatory staff... opposite of what was believed

Is this important or minor? Why?

If true... yes!

2. How did the authors end up with more states in 1996-97 than in 1994?

Prior to Telecommunications Act of 1996, not all states allowed competitors to enter the market.

"observations that correspond to states that did not permit competitive entry were omitted from the data set" (p.297)

3. Why are there only 36 states plus the District of Columbia in 1996-1997?

"Owing to data availability limitations and to make the use of a LATA-level analysis meaningful, observations corresponding to local telephone markets served by regional Bell operating companies (RBOCs) composed the vast majority of the data set" (p.297)

No RBOC operations in Alaska, Connecticut or Hawaii... used Southern New England Telephone (SNET) for Connecticut; Cincinnati Bell and Rochester Telephone included; other ILECs such as GTE have incomplete or unavailable data... data covers 77% of all local phone customers in US

4. The main regressions in Table 4 are based on 262 observations. What does this sample represent?

unbalanced panel by LATA taken from:

25 states plus DC in 1994

31 states plus DC in 1995

36 states plus DC in 1996

Roughly 2 or 3 LATAs per state... linked to metropolitan statistical areas

Dropped LATAs in rural areas? Would make sense because they may not have entry, but should've addressed it in paper

5. How is entry measured? Would you measure entry differently if the data permitted?

ENTRY - raw number of new fringe competitors that hold telephone numbers in LATA i during year t ; computed by taking difference between number of CLECs that hold numbers in year t and year $t - 1$... \therefore measures net entry

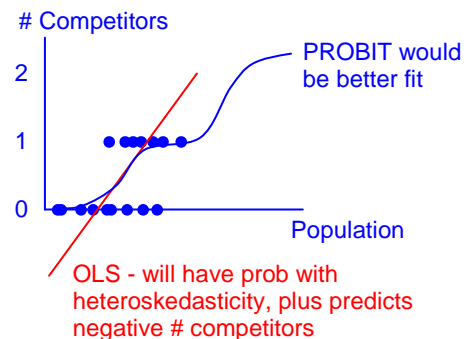
FRSIZE - raw number of fringe competitors (composed of CLECs) that hold telephone numbers in LATA i during year t

Holding numbers doesn't mean you're a competitor (may not actually be serving customers), but other data doesn't exist

6. OLSQ is used to test the empirical model. Would another statistical procedure have been preferred?

Dependent variable is discrete, plus it's skewed downward (e.g., FRSIZE mean is 2.1, but range from 0 to 16; ENTRY mean is 1.3, but range from 0 to 11)

"It is common to analyze panel data using either a random-effects or fixed-effects approach" p.304... we haven't covered this in econometrics!



7. What do the LATA fixed effects capture?

"inclusion of cross-sectional fixed-effects variables, γ_i , in this estimation will produce asymptotically consistent estimates of the explanatory variables if permanent or highly serially correlated LATA effects, not accounted for by the explanatory variables, are present in the data" p.304

Local Politics - "agreements are typically negotiated between each new entrant and the ILEC that has operations in a market, but are subject to final approval by the state commission that has jurisdiction" p.302

Geographic Area - cost of providing service may differ between geographic areas in a way that's not captured in other variables

May be better to capture firm fixed effects instead of the LATA

Bottom line... should have economic reason for using a fixed effect

8. Provide an intuitive explanation for the finding that price cap regulations hinder entry.

"keep prices at a level that reduces the fringe's aggregate share of the local market relative to a market share predicted with less stringent regulation" p.299... i.e., prices are lower in price cap market

"alleged inefficiencies brought about by traditional rate-of-return regulation would make incumbent firms under this form of regulation more susceptible to competitive entry" (p.300)

9. Are the data on LATA demographic characteristics based on all the people in the LATA? If not, to what geographic area do the data pertain?

No; based on primary metropolitan area

"information corresponding to the primary metropolitan area within a LATA is the best approximation for that particular LATA" (p.296)

There is data available by county for population and per capita income... would be harder to collect, but possible

10. Does PCREG or POLIT have a greater impact on entry?

PCREG - 1 if price cap regulation

POLIT - ranges continuously from 0 to 1 with scores closer to 1 signaling a Republican bias and closer to 0 signaling a Democratic bias

For commission - give 0 to Dems, 1 to Reps and 0.5 in unknown; add it up and divide by number of commissioners

Poor name... should maybe call it REPUBLICAN (which shows that higher value corresponds to Republican bias)

$\beta_{PCREG} = -0.7769$ and $\beta_{POLIT} = 3.2466$... \therefore POLIT has greater impact

1 StDev is 0.274 so "typical" effect is $0.274(3.25) = 0.89$... interpretation: if POLIT rises by 1 StDev, then expect another 0.89 firms to enter

11.a) Should POP have a positive coefficient? Why?

POP - measure of population

"higher levels of population indicate the presence of more potential customers... the size of a market is an important determinant of the number of firms that operate in that market" (p.301)

b) How great an impact does POP have on entry?

0.01029 per person (average POP is 1.7M)

To get new entrant, "need just under 100,000 people" p.307... don't know how he got this # StDev is 1.9M so $1.9M(0.01029) = 24,510$... doesn't make sense that 1 StDev would lead to 24K entrants... could be that author used different scaling on POP than what's displayed in Table 3

GROW - population growth rate for LATA i during year t ; expect higher growth rates to signify more profitable market... not statistically significant

INC - per capita income for LATA i during year t ; could be derived effect (e.g., more income suggests more businesses which means greater demand for phone lines)

12. The author argues that PROFIT is exogenous. Is this convincing?

PROFIT - profit per telephone line for the ILEC servicing each LATA i during year $t - 1$;
footnote 18 says that it's actually a state-level measure (not LATA)

"directly measures profitability of a new entrant's most potent competitor" p.300

"many difficulties arise when using profit measures derived from industry accounting records... different accounting practices... single industry in which regulators require each incumbent to report financial activities, the variance in accounting methodology, which still present, is likely to be kept in check" p.300

"while it remains true that any calculated measure of profit does not reflect actual economic profits, there is good reason to believe that the relative differences in profitability across markets are still signaled by these calculations" p.300

"predetermined measures of incumbent profitability are employed to maneuver around this potential statistical problem" p.301

Note 1: using firm's total profit divided by # lines or only looking at profits for basic service?

Note 2: maybe account for \$ spent lobbying since these are monopoly profits spent to prevent entry

13.a) How is WAGE defined?

average hourly wage paid by the manufacturing sector of the metropolitan area that corresponds to each LATA during year t

b) Is this a good measure of the cost of labor for a potential entrant?

not all workers are manufacturing sector (customer service, construction); besides, manufacturing sectors can vary a lot between regions; can use occupation related wages which are estimated by BLS for all metropolitan areas

WAGE - prediction is negative (higher wages imply higher costs so less likely to get new entrants)

Problem - profit should already incorporate wages

DEN - population density for LATA i during year t ; expect positive effect because higher density means lower cost for service... has right sign, but not statistically significant

Problem - using it in linear functional form; would probably be better with exponent < 1 or with natural log

14. What is the hypothesis for ELECT?

ELECT - binary variable that takes on the value of 1 if commissioners in state are elected and 0 if appointed

"believe that elected commissioners would act differently than appointed commissioners since they may be more vulnerable to the political process" (p.303)

$H_0: \beta_{\text{ELECT}} \neq 0$

Note: What do consumers want: more firms or lower prices?

15. A positive coefficient is predicted for POLIT? Why?

POLIT - ranges continuously from 0 to 1 with scores closer to 1 signaling a Republican bias and closer to 0 signaling a Democratic bias

"expect development of a competitive fringe to be positively related with commissions having a Republican bias"... \therefore positive coefficient

16. Are you confident that the regression in Table 7 explains the size of the PUC staff?

Could argue for each of the variables listed would impact PUC staff... each has expected sign too

148 observations... doesn't say where they come from

Finding... PCREG positively correlated with STFPLN (staff per line)... but no other variables are significant

17. Are there any variables that you would add to or delete from Table 7?

PUC size from previous year?

companies being regulated

industries regulated (utilities could include electricity, water, natural gas, etc.)

Lessons

1. Think carefully before picking variables
2. It's possible to specify equations to distinguish between two conflicting theories

Culbertson & Bradford: *The Price of Beer*

1. What is paper's contribution?

How does this paper push out frontier of knowledge?

Hogarty and Elzinga (1972) - "per adult consumption of beer was positively related to per capita income and the inflation-adjusted price of beer across forty-four states and the District of Columbia" (276)

Ira and Ann Horowitz (1965) - "combined cross-section and time series data on beer consumption yielded insignificant income coefficients and a weak, negative correlation with state excise tax levels used as a proxy for the price of beer" (276)

Ornstein and Hanssens (1985) - "found expected and significant relationships to exist between the annual per capita consumption of beer (by state) and a number of economic, regulatory, and sociodemographic influences... found price and income to have little impact on beer consumption relative to the remaining set of regulatory and sociodemographic variables" (276)

Jordan and Jaffee (1987) - "strong evidence that exclusive territory provisions in wholesaler contracts with retailers limit price competition in beer distribution... 'lead to notably higher prices to both retailers and consumers'" (287)

Differences -

Use data from all 50 states; "we know of no published study which has investigated the impact of exclusive territory laws using data from all fifty U.S. states" (286)

More recent data (mid-80s)

Issue of exclusive territories

Unique and untapped database

What do we know that we did not know before?

Exclusive territories for distribution increase price

Is this important or minor? Why?

Kind of common sense isn't it?

2. Theory:

Demand

Demand-pressure - usually measured by per capita income

Price of Substitutes - wine, liquor, soft drinks

Supply

State & Local Excise Taxes - federal excise tax is constant over all state so it doesn't matter

Exclusive Territories -

Proponents - "enhances consumer welfare by promoting interbrand (and related products) competition, eliminating the quality-eroding, free-rider problems among wholesalers, and allowing for better quality control at point-of-sale service" (281)

Opponents - "obvious potential for anti-competitive effects... nothing less than a government enforced cartel with broad discretion regarding price and limited only by interbrand competition in the retail marketplace" (282)

Transportation Cost - only focusing on "unusually high" costs

"present limitations of our data set prevent any meaningful empirical tests at this time"
(280)

"we assume that the same production and cost functions exert a uniform influence on beer prices in each state with any differences to be account for by the supply-demand factors identified throughout this paper" (280)... what about labor costs (truck drivers in each state may be different wage)

"interstate differences in the price of beer can be accounted for by two sets of factors" (279)

Common - characterized by different levels of variables common to all states (e.g., different levels of state excise tax)

Unique - "this items--economic, legal, socio-demographic--which are unique to a particular state and create a potentially different impact on the price of beer" (279)

Price = f (supply [distance from brewery, tax], demand [retail sales, price of substitutes], exclusive territories, quantity consumed)

Quantity consumed is "jointly endogenous" with price

Neither a demand function or supply function... no real economic theory here

3. Description of Variables:

Retail Price of Beer - average retail price of a 12-ounce six-pack of Budweiser or Schlitz beer for three years 1985-1987; "our hope is that this provides a representative observation from each state, unbiased by any particularly unusual price-report in a given year or quarter." (281)

D_i - 1 if Alaska or Hawaii; 0 for other states; "most other states are within a few hundred miles of major breweries"

Expectation - positive (higher cost \Rightarrow higher price)

Result - 0.45 (0.229)... impact: (binary) price is \$0.45 higher in AK and HI

Problem - very broad brush; have location of breweries, could probably get better estimate by using 0,1 for whether state has a brewery; also ignores differences in truckers wages... discuss this more in second paper

T_i - 1 for 33 states that mandate licensed wholesalers must distribute beer only within their designated and exclusive territories; 0 for other states which don't require it

Expectation - positive (exclusive territory \Rightarrow higher price)

Result - 0.11 (0.071)... impact: (binary) price is \$0.11 higher with exclusive territory

Problem - just marks whether law requires it, but other states may have exclusive contracts anyway (except Indiana); "fairly strong statistically"... no it's not

E_i - level of state and local excise taxes on beer in state

Expectation - positive (higher tax \Rightarrow higher price)

Result - 0.38 (0.33)... impact: ?? (no StDev)

Problem -

B_i - per capita consumption of beer in state

Expectation - unknown; "both influenced by price and a price influencing factor"

Result - -0.01 (0.009)... impact: ?? (no StDev)

Problem - endogeneity problem

S_i - per capita retail sales (of all items) in state; measure demand pressure, usually done with income; "retail sales would capture better the influence of demand-pressure"

(282)... ** people who shop in an area aren't necessarily the same as the people that live in the area; example: NV & NH rank 2nd & 3rd, respectively, in retail sales (all items), but not in top-10 in terms of per capita disposable income

Expectation - positive (higher sales \Rightarrow higher price)

Result - 0.01 (0.005)... impact: ?? (no StDev)

Problem -

W_i - retail price of wine in state; "1.5 liter Paul Masson chablis"

Expectation - positive (higher price of wine \Rightarrow higher price)

Result - 0.20 (0.058)... impact: ?? (no StDev)

Problem - why that specific brand? could've used more prices (either as weighted average or in place of wine to see if coefficients change)

I_i - 1 for Indiana which specifically makes it illegal to have exclusive territories

Expectation - negative (no exclusive territories \Rightarrow lower price)

Result - -0.36 (0.227)... impact: (binary) \$0.36 lower price in IN

Problem -

4. Sample:

Source:

Prices from "Price Report" of the Inter-City Cost of Living Index compiled by the American Chamber of Commerce Researchers Association; published quarterly; 60 items in over 250 cities in all states except Hawaii

Hawaii data from Mr. Gillis Hills of Southland Corporation

** Doesn't say where other data comes from

Data points:

50... actually 150 (3 years for each state, but using average)

Is sample appropriate or optimal for study?

5. Analysis:

Statistical Technique

OLS... 4 equations:

1. $P_{\text{beer}} = a_0 + a_1D_i + a_2E_i + a_3B_i + a_4S_i + a_5W_i + a_6T_i$
2. (drops T_i) $P_{\text{beer}} = a_0 + a_1D_i + a_2E_i + a_3B_i + a_4S_i + a_5W_i +$
3. (adds I_i) $P_{\text{beer}} = a_0 + a_1D_i + a_2E_i + a_3B_i + a_4S_i + a_5W_i + \quad + a_7I_i$
4. (all vars) $P_{\text{beer}} = a_0 + a_1D_i + a_2E_i + a_3B_i + a_4S_i + a_5W_i + a_6T_i + a_7I_i$

Results

Eqn1 - "error term does not appear to be systematically related to any other obvious factors) (285)

Eqn 2 - "Strong similarities found among these estimates suggests considerable confidence may be placed in the marginal significance of exclusive territories as estimated in eq. (1)" (285)

"Perhaps the most notable feature of the results reported in table 1 is how consistently our estimated coefficients behave across all four equations." (286)

"Ramsey (1969, 1974) has developed a general test to detect specification errors arising from omitted variables, incorrect functional form, and/or contemporaneous correlation" (286)... no probs with Eqns used

4. Does paper do a good job of testing theory?

Are there serious flaws?

"potential simultaneity bias stemming from ordinary least squares (OLS) estimation of a beer-price equation that includes per capita beer consumption as an explanatory variable... use of nominal beer prices" (Sass & Saurman p162)

Poorly specified model; not really linked to economic theory; problems with OLS too...
probably better off running 2SLS or simultaneous equations

Omitted variables:

Demand:

- Price of other (better) substitutes: liquor, soda
- Religion (e.g., %Baptist or other religions that frown on drinking)
- Age structure (%Legal, %21-30)
- College measure (%population in college, # major universities)
- Tourism measure
- "Toughness" of alcohol laws (DUI, public intoxication, etc.)

Supply

- Cost of inputs (labor, hops)

None of the results are statistically significant

How can the empirical work be improved?

- Didn't list descriptive statistics for variables

- Didn't address, but described:

"bottle bill" legislation - mandatory-beverage-container-deposit laws "have the potential to increase costs and therefore prices resulting in negative impacts on consumption and industry employment" (279)

beer-cash laws - require retailers to pay cash-on-delivery from wholesaler's truck

Sass & Saurman: Mandated Exclusive Territories and Economic Efficiency: An Empirical Analysis of the Mal-Beverage Industry

1. What is paper's contribution?

How does it push out frontier of knowledge?

"substantial disagreement among economists over the effects of these vertical territorial restrictions" (154)

"restrictions... reduce competition" (Shepherd)

"exclusive territories tend to promote economic efficiency on balance" (Shughart)

Articles on vertical territorial retractions include audio components, hearing aids, sailboats, soft drinks & beer... lists authors... **"none of these articles include empirical tests"** (153)

"The only published empirical analyses of the effects of exclusive territories are three recent studies of the malt beverage industry" (162)... focus solely on price effects (exclusive territories associated with higher prices)

Klein & Murphy (1988) - analysis of private exclusive territorial contracts

Schwinn Ruling (1967) - declared exclusive territories to be illegal... "but firms continued the policy that wholesalers were expected to confine their sales efforts to their assigned territories" (155)

Sylvania Ruling (1977) - overruled Schwinn; "rule-of-reason approach to nonprice vertical restraints... brewers signed exclusive territories or wholesalers (except where prohibited by law)" (156)

State Laws -

1. Require brewers to have exclusive distributor territories
2. Prohibits exclusive territories (Indiana)
3. Either mandate assigned territories without requiring exclusivity or are silent on the issue

What do we know that we did not know before?

"findings are consistent with the notion that exclusive territories encourage dealer-level promotional activities but come at the expense of creating local, intrabrand monopolies" (154)

"lead to simultaneous increase in demand and decrease in final market supply" (154)

Focused on efficiency, not just price

Empirical evidence to resolve conflicting theories (see proponents & opponents from previous paper)

Is this important or minor? Why?

2. Theory:

3 major explanations for exclusive territory contracts

Dealer-Cartel Enforcement - Bork; Carstensen & Dahlson; dealers seek to restrict competition among themselves & insulating colluding dealers from competition and new entrants... leads to higher price and lower output... *doesn't address why manufacturers would agree to the restrictions*

Reduction of Free-Riding - Klein & Murphy; prevent consumer free-riding on special services that are associated with but separable from the product; "dealers provide demand-enhancing special services"... customer can't determine which dealers are to blame for reduced product quality so individual dealers will not bear full cost of nonperformance... weak

Purchase of Dealer Promotional Services - Klein & Murphy; advertising displays, shelf-space procurement, credit to retailers, other point-of-sale promotions, temperature control during transportation... increase demand and reduce supply leads to higher price and indeterminate change in quantity

Arbitrage Among Wholesalers - Carstensen & Dahlson; doesn't allow manufacturer to price discriminate... restrictions unnecessary if markets are separated by transportation costs

** Brewers & wholesalers have campaigned for state & federal laws requiring exclusive territories... trying to avoid costs of enforcing private contracts; could also have legal challenges to exclusive-territory contracts

$BeerQ^D = f(\text{PRICE, BAN, MANDATE, NOCONTRACT, FORCEDEP, PCSALES, TOURISM, PCTMETRO, MINAGE, POP18})$

$BeerQ^S = f(\text{PRICE, BAN, MANDATE, NOCONTRACT, CASHLAW, TAX, DISTANCE, RETAILERS})$

3. Description of Variables

BEERQ - shipments/apparent consumption of malt beverages including imports, in thousands of gallons

BAN - 1 for Indiana; 0 otherwise

Expectation - negative on price and demand; positive on supply

Result - -14% (p^*), -12% (Q^D), +44% (Q^S); 0 (q^*)

Problem -

CASHLAW - 1 if state law required retailers to pay immediately for beer purchased from wholesalers

Expectation - negative on supply

Result - +12.8% (p^*), -31% (supply)... "implausibly large?"

Problem -

DISTANCE - distance along major highways from most populous city in a state to the nearest "major" brewery
Expectation - negative on supply
Result - -0.8% (p^*), -1.9% (supply)
Problem - average distance; focus on breweries for same beer as price data

D1982-1986 - 1 for given year; 0 otherwise
Expectation -
Result -
Problem -

FORCEDEP - deposit laws increase time costs associated with consumption and exchange (require interest-free loans by beer consumers)
Expectation - negative on demand
Result - -5% (p^*), -8% (demand), -5% (q^*)
Problem -

LT100 - fraction of beer-price-reporting cities in state that have populations less than 100K
Expectation - unknown on demand
Result -
Problem -

MANDATE - fraction of year that state had law requiring establishment of exclusive territories by brewers
Expectation - positive on price; positive on demand; negative on supply
Result - +7% (p^*), +10% (Q^D), -17% (Q^S); 0 (q^*)
Problem -

MINAGE -
Expectation - negative on demand
Result - +.6% (p^*), -2.4% (demand)... impact of going from 18-21: $-2.4(3) = -7.2\%$
Problem -

NOCONTRACT - fraction of year 1982 that state law neither required or banned exclusive territories
Expectation -
Result -
Problem - correlated to MANDATE?

PRICE -
Expectation -
Result - 1.25 (demand), 1.86 (supply)... these are elasticities
Problem -

PCSALES - real value of retail sales per person 18 and over... same as Culbertson & Bradford's S_i ... to capture aggregate spending by residents and nonresidents within a state
Expectation - positive on demand
Result -
Problem -

PCTMETRO - percentage of total population living in metropolitan areas
Expectation - unknown on demand
Result -
Problem - correlated to LT100?

POP18 - state population aged 18 and over
Expectation - positive on demand
Result - +1.2% (p^*), 105% (demand), +100% (q^*)... \therefore double population means double quantity demanded (makes sense)
Problem -

PRICE - average real price of 6-pack of Bud or Schlitz in third quarter of each year

Expectation - negative on demand

Result -

Problem -

RETAILERS - total number of grocery stores, liquor stores, & bars

Expectation - positive on supply

Result - 113% (supply)... make sense (double # retailers doubles supply of beer)

Problem - correlated to population? probably why it was removed from p^* and q^* equations

TAX - state packaged-beer real excise tax per 6-pack plus federal 6-pack equivalent real excise tax

Expectation - negative on supply

Result -

Problem -

TOURISM - ratio of hotel, motel, and tourist court receipts to retail sales

Expectation - positive on demand

Result -

Problem -

4. Sample:

Source:

1982-1987 from *Census of Retail Trade*, *Census of Wholesale Trade* and *Census of Service Industries*... data for 36 states

Price data from American Chamber of Commerce Researchers Association Inter-city Cost of Living Index... problem - identify of cities in sample varies over time; cities sampled may not be representative of the state as a whole... maximize sample size and minimize sample variation by restricting price sample to only cities that reported beer price in third quarter of each year

Nominal prices deflated by price index constructed from interstate cost of living index

data points:

82-87... 6 years * 36 states = 216... 288 for quantity (ignored price data restriction)

Is sample appropriate or optimal for study?

Change in law... during early 80s, states started passing laws to require exclusive territories (should have before & after law for each state)

5. Analysis

Statistical Technique

Converting continuous data (except % and ratios) to natural logarithms

OLS for Equilibrium price and quantity

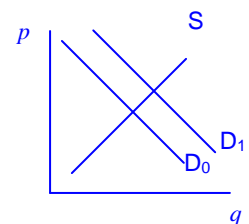
2SLS for Q^D and Q^S

1 run with all data; 1 run averaging all time periods (36 data points)

If properly specified, we could use 2SLS to estimate each function; use prediction of one function to estimate the points of the second one

$$Q^D = a + bP + cM$$

$$Q^S = d + eP + fC$$



Results

p169-170

BAN lowers price 14% and lowers demand by 12%

MANDATE raises price 7% and increase demand by 10%... no significant influence on equilibrium quantity

"estimated price elasticity of supply is roughly 50% larger than demand elasticity" (172)

"there is no welfare gain to consumers associated with dismantling state laws that mandate exclusive territories. We estimate the reduction in consumer demand to be roughly offset by the increase in retail supply... Evaluating overall welfare effects, however, requires determining the effects of state mandates on the welfare of retailers, wholesalers, and brewers... Given that brewers and wholesalers have expended resources to obtain state mandates, they must have expected to gain from the restrictions. (172-173)

6. Does paper do a good job of testing theory?

Are there serious flaws?

How can the empirical work be improved?

Klepper & Simons: The Making of An Oligopoly: Firm Survival and Technological Change in the Evolution of the U.S. Tire Industry

1. What is paper's contribution?

How does it push out frontier of knowledge?

Determinants of market structure:

Production scale economies - **Bain** (1956) & **Scherer et al.** (1975) say this doesn't appear to explain much of the cross-sectional variation in the manufacturing industry concentration ratios

Marketing and distribution economist

Technological change

First-mover advantages

"Shakeout" in tire industry - # firms declined 80% in 14 years

Knox (1963) - mass distributing methods & decreased demand from increased tire mileage

Jovanovic & MacDonalds (1994) - Banbury mixer (major process innovation)

Warner (1966) - cost of staying up with the technological frontier in the post shakeout era was prohibitive for all but the leading firms

French (1991) - technological change and marketing & distribution

What do we know that we did not know before?

New information on early evolution of tire industry; new data set assembled from firm price lists of product offerings (see #4)... coupled information with data of entry, date of exit, form of exit, size, location, and distribution network for each firm to analyze role of technological change

New technology economized labor... "wholesale price index of tires declined from 175 in 1914 to 47 in 1937" (732)

Finding - older and larger firms survived longer (because influence of age and size on technological change); firms located around geographic center of industry were more technologically progressive

Key is using data from the time to test the theory; previous papers didn't really use data; they were more speculative

Is this important or minor? Why?

2. Theory:

Changing Technology - actually happened; theory deals with what this means to market structure

Tire life increased (1000 to 20000 miles)

Cord, fabric, balloon tire

Labor productivity $\uparrow \Rightarrow$ price of tires \downarrow

Klepper (1996) - model to explain shakeouts and evolution of market structure; assumes increasing returns from R&D

Discrete Periods - "in each period a new "cohort" of potential entrants composed of start-ups and firms with experience in related technologies and industries arises" (734)

Potential entrants are assumed to be heterogeneous in capabilities so only a fraction of potential entrants are capable of conducting innovation (rest are called "imitators")

Innovators invest in R&D to lower their average cost of production in that period \therefore profits gained from R&D are scaled by output of the firm (R&D in each period subject to diminishing returns); innovations costlessly imitated by all firms one period after they are introduced

Production has increasing scale economies at low output, then constant
Industry demand assumed to be constant over time

Firms are price takers

Firms exit because max profit is negative or "adverse decisions (i.e., probability of random exit, which is lower for innovators than for imitators)

Implications -

- Firms expand until MC of growth = price-cost margin (i.e., innovators are always larger than imitators in same period)
- Price declines over time \therefore initially innovators & imitators enter; then only innovators enter; then nobody enters (exit continues)... industry dominated by earliest entering innovators

Hypotheses (Table 2):

1. The likelihood of cord production falls and then rises with firm age and also falls and rises with firm size, and the dispersion of firm sizes is lower in early- and late-entry cohorts than in intermediate entry cohorts
2. Given the age and size of the firm, the likelihood of cord production is greater for firms located around Akron
3. The hazard of exit is lower for older firms and for firms located around Akron
4. Given firm size and cord production, the hazard of exit is unrelated to the age of the firm and whether it is located around Akron
5. For each size firm, the hazard of exit is lower for producers of the cord tire
6. Among producers of the cord tire, the hazard of exit is lower the larger the firm
7. Firm size lowers the hazard of exit more for producers than for nonproducers of the cord tire

Intuition -

Innovator - price-cost margin falling; firm that makes new innovations that can take advantage of lower cost are more likely to succeed

Hazard functions - explain change (e.g., why firms exit); prob. of exiting the market

3. Description of Variables

Age - based on year of entry

Expectation -

Problem - Mergers & acquisitions treated as continuation of leading producer (keeps name) and exit of other firms

Size - based on 1920 total capitalization: 1 of 11 categories ranging from \$500-\$1,000 to \$1M and above; 12th category for unknown

Expectation - see mergers in Age

Years Survived - based on year of exit

Expectation - see mergers in Age

Akron - 1 if within 50 miles of Akron

Expectation - technology spillovers make it worthwhile for firms to be located near Akron

Distribution - 1 if had distributor in large cities

Expectation -

4. Sample:

Source:

Thomas' Register of American Manufacturers and Hendricks' Commercial Register of the United States for Buyers and Sellers (age, years survived, location, size of each firm)
Sep 1917, October 1920, and October 1923 issues of *Tire Rate Book* (quarterly industry trade journal)

data points:

155 firms listed (111 listing cord tires)

8 producers of core tires in 1917

21 producers of balloon tire in 1923

Is sample appropriate or optimal for study?

5. Analysis

Statistical Technique

??? (Table 3)

Logit model (Table 4)

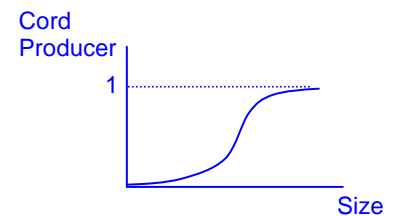
3 specifications for model 1... not clear on what the differences are

$$\text{Spec 2} - f(0,1) = a - 0.474(\text{Entry-1900}) + 0.013(\text{Entry-1900})^2$$

$$\frac{\partial f}{\partial (\text{Entry-1900})} = -0.474 + 2(0.013)(\text{Entry-1900}) = 0 \Rightarrow \text{Entry-1900} = 18$$

Spec 3 - first one to account for size... not significant

6 models for hazard of exit



Results

Once controlled for cord production, year of entry and location don't matter \therefore technology is the driving force behind the industry structure

Distribution network

6. Does paper do a good job of testing theory?

Are there serious flaws?

Good job of laying out theory and hypotheses, but doesn't explain technique for analyzing it very well

How can the empirical work be improved?

Not very good at explaining what he's doing with the analysis... looks like smoke and mirrors

Ajwad: New Evidence on the Link Between School Funding and Educational Outcomes: An Analysis Using School Campus-Level Data

1. What is paper's contribution?

How does it push out frontier of knowledge?

Education production function - students are intermediate inputs

Studies look at (a) direct measures of educational achievement (test scores) or (b) post-educational earnings

Hanushek (1996) - useful summary of 377 estimates of educational production functions from 90 published articles or books;

163 estimates of effect of expenditure per student on student achievement:

27% positive & significant

7% negative & significant

66% not significant... 35% positive; 19% negative; (rest unreported)

"the results lead to the conclusion that no strong or systematic relationship exists between expenditures and student performance" (4)

Betts (1996) - review of literature on relation between education resources and student career success (measured by earnings); strongest relationships measured with state-level data, but school-level data gives weaker result

"evidence in favor of a link between school resources and level of education reached is either weak or nonexistent" (5)

Sander (1993) - uses school-level data for Illinois; increase in teacher's salaries improve ACT scores & % college-bound students; increase in student-teacher ratio lowers graduation rates & % college-bound students

Ehrenbert & Brewer (1994) - school district expenditures per student; acknowledge and correct for endogeneity problem associated with school characteristics being the result of parental choices about which school to attend; "many of the included school characteristics are not statistically significant determinants of dropout rates or achievement test scores" (6)

Cullen (1997) - Texas; district expenditures per student to fraction of students passing state-administered exams, after controlling for demographic characteristics... "money does matter and is a positive determinant of educational outcomes" (6)

What do we know that we did not know before?

Unique school campus-level data; "there do not appear to be any studies that use school campus-level finance information to unravel the link between resources and educational outcomes" (2)

Whether education expenditures impact rich & poor students differently

Is this important or minor? Why?

"Judicial interest in equalizing resources across public school districts" (2)

2. Theory:

3. Description of Variables

Academic Performance - % passing = total number of students who passed the exam in all grades by total number of students taking the exam

Reading -

Writing -

Math -

All Three -

School Characteristics (school j)

Expenditures per Student (E_{jk}) -

Instruction - all activities dealing directly with interaction between teachers and students

Instructional Leadership - managing, direction, supervising, and providing leadership for staff who provide instructional services

School Leadership - involves directing and managing school

Campus Expenditures - resource centers and libraries; curriculum and instructional staff development

Support Services - guidance and counseling; social work; health services; food services; co-curricular/extracurricular activities; plant maintenance and operations; security and monitoring; data processing services

Problem - not focusing on where money is spent on students

Number of Students -

LEP - limited English proficient; fraction of total number of students in school designated by Language Proficiency Assessment Committee (LPAC) as LEP

Disadvantaged Students - sum of students eligible for free or reduced-price lunch or eligible for other public assistance, divided by total number of students

Problem - average 61.9% of students!

Gifted/Talented - as percent of total students

Neighborhood Characteristics

Race -

Median Family Income (I_{jk}) -

% Population with College Degree -

% of Family Households -

District Characteristics (school k) - constant across schools in a district

Instruments for "Difficulty-to-Educate" -

Special Education - as percent of total students

Average Years Teacher Experience - weighted average of full time equivalent count and years of experience

Teacher Tenure - years in same district

Student-Teacher Ratio - total number of students divided by total teacher FTE

Attendance Rate - fraction of school days attended by students

School Drop Rate - fraction of all students enrolled who quit

4. Sample:

Source:

Socioeconomic information from 1990 Census of Population and Housing

Assumed that census tract is the attendance zone for the school in that tract

Problem 4046 census tracts, but only 1960 schools?

Linked schools to tracts based on lat-long from address

Public school district data from 1992 census of governments

Performance data from Academic Excellence Indicator System (AEIS) on Texas

Assessment of Academic Skills (TAAS)... includes student characteristics, staff characteristics, school finance and academic performance indicators from 1996-1997 academy year

Problem - census info changed over 6 years?

data points:

3664 schools... drop those without mailing addresses (or with PO boxes) and end up with 1960; those with less than 120 students (18 schools), and top and bottom 1% based on expenditure per student... results in 1901 elementary schools (309 districts serving 1.1 million students)

"There is no a priori reason to believe that there is a selection of bias associated with the sample selection method adopted" (7)... self approval?

Is sample appropriate or optimal for study?

Demographics - some summary stats are questionable... average 18% college? does this come from adding straight percentages or is it weighted based on population?

Elementary - only looking at elementary schools for demographic data, but using TAAS scores from 7th, 8th and 10th grade (in addition to 3rd and 4th)

"The most important pupil characteristic that determines educational outcomes is the unobserved innate ability of the pupil. Effective techniques for quantifying the innate ability of pupils for empirical analyses are scarce" (9)

"Governments skew funds toward schools with high proportion of hard-to-educate pupils" (11)... need something to measure relative difficulty-to-educate

Disparity - "disparities in the outcome variables are not as stark as the input disparities" (13)

5. Analysis

Statistical Technique

$$Pass_{jk} = \dots \alpha I_{jk} + \beta E_{jk} + \rho I_{jk} \cdot E_{jk} \dots \quad \frac{\partial Pass_{jk}}{\partial E_{jk}} = \beta + \rho I_{jk} \quad \therefore \rho > 0 \Rightarrow \text{effect of expenditure increase}$$

on pass rate is larger in high-income neighborhoods

E_{jk} correlated with error term... school spending determined endogenously as function of neighborhood characteristics (e.g., spending high in neighborhoods with certain characteristics)

2SLS -

Instruments - % student body in special education program

Variables in Expenditure & not in %Pass:

#Students² - significant

% Free lunch - not significant

% Special ed - significant

% Same dwelling in 1985 - not significant

% 5-17 - not significant

% 30+ minute commute - not significant

% Homes owner occupied - not significant

Problem - % special ed increases spending, but the special ed kids don't take the test; ** should've netted expenditures for special ed

Results

Rich - "pupils from rich families perform better than pupils from poor families" (13)... goes back to endogeneity problem

Expenditures $\uparrow \Rightarrow$ Pass rates \uparrow

Income $\uparrow \Rightarrow$ Pass rates \uparrow

Expenditure-Income $\uparrow \Rightarrow$ Pass rates \downarrow ... i.e., "marginal effect of spending on achievement is decreasing in income" (16) "leading to the conclusion that the marginal productivity of education dollars is stronger for students from low-income families" (17)

Expenditure -

students - significant and -

students² - significant and +; scale economies

% LEP - not significant

% economically disadvantaged - not significant

% special ed - significant and +

% gifted/talented - significant and +

% living in same dwelling as 1985 - not significant

% black - significant and positive

% Hispanic - not significant

% other - not significant

Median family income - significant and negative

%5-17 - not significant

% college degree - significant and +

% families - not significant

% >30 min commute - not significant

% owner occupied - not significant

Problem - could have multicollinearity problem (too many variables)

Pass Rate -

% LEP - significant and -

% gifted/talented - significant and +

% black - significant and -

% Hispanic - significant and +

% other - significant and -

% parent with college degree - significant and +

% families to households - significant and -

spending per student - significant and +

6. Does paper do a good job of testing theory?

Are there serious flaws?

"Hispanic residents in the neighborhood are associated with high pass rates... a 10 percentage point increase in the proportion of Hispanic residents is associated with a 0.9 percentage point increase in pass rates" (15)... that's high pass rate?!... confusing statistical significance for economic significance?

How can the empirical work be improved?

Looking for favorites among schools within a district - look at within district spending and look at standard deviation; if stdev is sizeable within a district, there could be evidence that some schools are getting much more money than others
Dependent variable - school income / district income

** Didn't carefully consider why variables were included

"Good example of what not to do" -Kenny

Thorbecke: Explaining House Voting on the North American Free Trade Agreement

1. What is paper's contribution?

How does it push out frontier of knowledge?

Heckscher-Ohlin Model and Stolper-Samuelson (S-S) Theorem - capital (abundant factor) will gain and labor (scarce factor) will lose; modified for 3 factors: capital and skilled labor benefit and unskilled labor loses (Leamer)

Richardo-Viner (R-V) Theorem - both capital and labor in export industries will gain; import competing industries will lose (industry specific rather than factor specific like S-S)

Magee (1980) - investigated revealed preferences of lobbyists on Trade Reform Act of 1973; evidence supported R-V over S-S, but TRA73 was short run phenomenon

Public Choice Model - representatives on issue seek to redistribute wealth to constituents, not to advance economic efficiency

Leamer (1993) - capital and high-skilled labor likely to gain from NAFTA; low-skilled labor likely to lose; NAFTA is long run phenomenon

Tollison (1988) - those who gain from policy demand it

Rowley, Thorbecke, Wagner (1994) - demand implies willingness to pay (votes or campaign contributions)

Henderson (1993) - constructed list of industries whose employment was likely to expand due to NAFTA... urban areas

What do we know that we did not know before?

S-S for NAFTA - Leamer said NAFTA is long run; AFL-CIO "emphasizing the conflict between capital and labor" (233); "every labor union that testified before the International Trade Commission (ITC) favored protectionism" (233)

Position of Labor & Capital - table 1

"Geographical and electoral constituencies exert an enormous impact on a representative's voting patterns" (240)

Uses vote on NAFTA to decide whether S-S or R-V is more accurate view of NAFTA

Is this important or minor? Why?

2. Theory:

Electoral Constituents - interest groups providing contributions

Geographical Constituents - individuals and firms located in their districts

3. Description of Variables

V = Vote for NAFTA - vote in House of Representatives; 1 for yes; 0 for no

SER = % Service Workers - % workers employed in service industries

Expectation - $\uparrow \Rightarrow$ vote against

Result - -0.028 (t-stat: -2.09); Impact: $2.9(-0.028) = -8\%$

Problem - tried to justify this to measure low-skilled workers because they have lower average incomes than manufacturing workers and less education than workers in high-technology industries... so. Ran model on table 2, p.237, but most of regressors are correlated to population (larger cities tend to have larger service sector!); Kenny: service sector jobs aren't in risk of being moved to Mexico

FARM = % Farmers -

Expectation - $\uparrow \Rightarrow$ vote for (because capital intensive)

Result - 0.04 (t-stat: 2.75); Impact: $2.4(0.04) = +10\%$

Problem - not all farmers benefit; specifically lists groups that were against it... cover those farmers with LOSE

CO = % College Education -

Expectation - $\uparrow \Rightarrow$ vote for

Result - 0.02 (t-stat: 3.22); Impact: $8.0(0.02) = +16\%$

Problem - college educated doesn't mean high-skilled labor... Kenny: "this is a commonly used measure"... also near multicollinearity problem with % service; if this measures skilled workers and % service measures unskilled, then you don't gain anything by having both variables

Y = Median Family Income -

Expectation - Uncertain...

Result - -0.00001 (t-stat: -1.88); Impact: $9290(-0.00001) = -14\%$

Problem -

WIN - 1 if urban area identified by Henderson (1993) as "winners" (employment in industries that gain exceed 7.5% of workforce) in representative's district

Expectation - 1 \Rightarrow vote for (based in Henderson (1993))

Result - 0.22 (t-stat: 2.12); Impact: $1 = +22\%$

Problem -

LOSE = Lose - industries likely to lose from NAFTA: flat glass, household glass, broom-making, flower, peanut (based on industry representatives testifying before ITC)

Expectation - 1 \Rightarrow vote against

Result - -0.12 (t-stat: -1.35); Impact: $0.30(-0.12) = 3.5\%$

Problem -

CLOSE = Border Mexico - 1 if state bordered Mexico

Expectation - 1 \Rightarrow vote for

Result - 0.21 (t-stat: 2.55); Impact: +21

Problem -

LCV Rating -

Expectation - $\uparrow \Rightarrow$ vote for

Result - 0.0036 (t-stat: 1.70); Impact: $26.8(0.0036) = +10\%$

Problem - if NAFTA is not going to make the environment better, why would environmental group argue in favor of NAFTA; Kenny: environmental dimension is almost perfectly correlated to ADA rating so there is probably strong correlation between LCV and ADA (near multicollinearity problem)

ADA Rating -

Expectation - $\uparrow \Rightarrow$ vote against

Result - -0.008 (t-stat: -4.77); Impact: $34.8(-0.008) = -29\%$

Problem - ADA not about how liberal the district is, it's based on the representative's voting record; more direct measure of constituency: voter registration or better: election results (% voted for liberal candidate)

% Below Poverty -

Expectation - $\uparrow \Rightarrow$ vote against

Result - -0.008 (t-stat: -0.64); Impact: $6.1(-0.008) = -5\%$

Problem - if using this measure why use % service workers?

Median Age -

Expectation - $\uparrow \Rightarrow$ vote against (older workers more resistant to temporary dislocation)

Result - -0.02 (t-stat: -1.61); Impact: $2.6(-0.02) = -5\%$

Problem - retired person isn't worried about NAFTA; this measure includes retired people; should focus on age of work force

% Vote for Perot - based on 1992 election

Expectation - $\uparrow \Rightarrow$ vote against (Perot big on protection; "big sucking sound")

Result - -0.005 (t-stat: -0.83); Impact: $6.2(-0.005) = -3\%$

Problem -

% Export Jobs - percentage of workers in state engaged in export employment

Expectation - $\uparrow \Rightarrow$ vote for

Result - 0.016 (t-stat: 1.17); Impact: $2.2(0.016) = +3\%$

Problem - correlated with WIN?... also this is based on state-level variable

4. Sample:

Source:

Americans for Democratic Action (ADA) - liberal quotient to represent the electoral constituency of members of Congress... **Grier** (1991) "statistically significant negative relationship between ADA ratings and corporate contributions"

Recompute - had to drop NAFTA vote from ADA rating

League of Conservation Voters (LCV) - representatives on environmental issues; Clinton Administration agreed to create Environmental Protection Commission so environmental lobbies supported NAFTA

Congressional Districts in the 1990s

Export employment from Whalen (1986) *** kind of old

data points:

434

Is sample appropriate or optimal for study?

House instead of Senate - districts are smaller and more clear winners and losers from NAFTA; in Senate, the districts are states so it's not as clear as to who gains (too much variety within the district); House districts have the variety between them

Paper written in 1994, but data for contributions from PACs weren't available for 1991-1992... more of a sad commentary on our stupid campaign system (we should have immediate and public full disclosure)

Export employment data is old

Good - covers impact of variables (StDev*Coefficient)

5. Analysis

Statistical Technique

Probit

$$V = \alpha_0 + \alpha_1 \text{SER} + \alpha_2 \text{FARM} + \alpha_3 \text{CO} + \alpha_4 \text{Y} + \alpha_5 \text{WIN} + \alpha_6 \text{LOSE} + \alpha_7 \text{CLOSE} + \alpha_8 \text{LCV} + \alpha_9 \text{ADA} + \alpha_{10} \text{PO} + \alpha_{11} \text{AGE} + \alpha_{12} \text{PER} + \alpha_{13} \text{EX}$$

Results

See above... Table 4, p.241

"All coefficients are of the expected signs and 9 of 14 are statistically significant at at least the 10% level." (240)... confirms S-S theory, but also has some evidence to support R-V (WIN)

6. Does paper do a good job of testing theory?

Are there serious flaws?

LCV result inconsistent; possible near multicollinearity; didn't discuss robustness of the model (were there other specifications run?)

Other multicollinearity problem... several variables to measure skilled vs. unskilled labor (%service, %college, median family income, %poverty)

How can the empirical work be improved?

Kenny: interesting attempt to explain very important vote in Congress; paper has flaws in variable selection, but still interesting

Black: Do Better Schools Matter? Parental Valuation of Elementary Education

1. What is paper's contribution?

How does it push out frontier of knowledge?

"Better schools tend to be located in better neighborhoods. As a result, estimates that do not sufficiently control for neighborhood characteristics may overestimate the value of better schools" (577)... higher house prices could be reflecting house or neighborhood characteristics that aren't otherwise being measured

Talked about studies linking school quality to test scores and future earnings... didn't really go into much detail... **Currie and Thomas** (1998); **Oppenheim** (1989)

What do we know that we did not know before?

"Look within school districts at houses located on attendance district boundaries; houses then differ only by the elementary school the child attends... effectively remove the variation in neighborhoods, taxes, and school spending... parents are willing to pay 2.5 percent more for a 5 percent increase in test scores." (577)

Is this important or minor? Why?

2. Theory:

Compare houses on opposite sides of attendance district boundaries (determine which school a child attends within a school district)... control for variation in property tax rates, school spending, neighborhood differences

"Fact that test scores make a discrete jump at attendance district boundaries while neighborhoods continue to change in a smooth manner allows me to isolate the relationship between test scores and house prices"

$$\ln(\text{price}_{iaj}) = \alpha + \mathbf{X}'_{iaj}\boldsymbol{\beta} + \mathbf{Z}'_j\boldsymbol{\delta} + \gamma\text{test}_{aj} + \varepsilon_{iaj}$$

\mathbf{X}'_{iaj} - includes characteristics of house i (# bedrooms, #bathrooms, etc)

\mathbf{Z}'_j - neighborhood and school district characteristics

test_{aj} - average test score in school that children living in attendance district a in school district j would attend

price_{iaj} - price of house i in attendance district a in school district j

"all relevant house or neighborhood characteristics cannot be observed; hence results are biased because of omitted variables... to eliminate such problems, the methodology explored here replaces the vector of observed characteristics with a full set of boundary dummies that indicate houses that share (on either side) an attendance district boundary" (579)

"Conceptually this methodology is equivalent to calculating differences in mean house prices on opposite sides of attendance district boundaries (controlling for house characteristics) and relating this to differences in test scores" (579)

3. Description of Variables

Price -

Bedrooms -

Bathrooms -

Bathrooms² - why?

Lot size -

Square footage -
Age of building -
Age² -
Boundary fixed effects -
Distance of house to Boston - proxy for commuting time
Distance of house to Boston² - proxy for commuting time
Census Variables -
 % Hispanic -
 % non-Hispanic blacks -
 Female-headed households with related children -
 People > 25 with bachelor's degree -
 People > 25 with graduate degree -
 People > 25 without HS diploma -
 Age distribution - 0-9, > 65, others
School District Characteristics -
 Per-pupil expenditures in 1993 -
 Pupil/teacher ratio -
 Existence of free or reduced-cost preschool program -
 Property tax rates -
 Test scores - sum of reading and math MEAP scores averaged over 1988, 1990, 1992

4. Sample:

Source:

All purchases and sales from 1993-1995 for Middlesex, Essex, and Norfolk counties in Massachusetts (suburbs of Boston)

*** Isn't a purchases matched to a sale?

*** Why not use tax appraisal or real estate broker appraisal?

1990 census data (for census block group identification)

School-district-level data for per-pupil expenditures, pupil/teacher ratios and property taxes

Massachusetts Educational Assessment Program (MEAP)... test scores from 1988, 1990, 1992... sum of math and reading averaged over 3 years

data points:

22,679 single-family homes in 39 school districts, 181 attendance district boundaries

0.35 miles from boundary... 10,657

0.20 miles from boundary... 6,824

0.15 miles from boundary... 4,594

Is sample appropriate or optimal for study?

"choose Massachusetts... school districts are small, which leads to a relative homogeneity of populations within districts... focus on elementary schools because only these schools allow for enough within-district variation" (580)

limited to single-family residences

must have at least two elementary schools that overlap grades

Didn't really address why some variables were included; didn't talk about how they're expected to affect the price of the house

Problem? - mean house price \$188K with StDev \$113K

"Sample is unique in that it contains a disproportionate number of relatively wealthy Boston suburbs" (585)

5. Analysis

Statistical Technique

OLS in Table II

Census block characteristics (used in regressions 1 and 5); trying to capture housing quality

Difference of Means in Table III

Results

Table II, Col 1 - didn't limit to houses on opposite sides of attendance district... 5% increase in score associated with 4.9% increase in house price (\$9280 at the mean)

Table II, Col 2 - within 0.35 miles from boundary... cuts score's effect in half

Table II, Col 3 - within 0.20 miles... no change from 0.35

Table II, Col 4 - within 0.15 miles... no change from 0.35

	Basic	0.35 miles	0.20 miles	0.15 miles
Coeff	0.035	0.016	0.013	0.015
%Δ price from 5%Δ score	4.9%	2.3%	1.8%	2.1%
\$value at mean	\$9212	\$4324	\$3384	\$3948
\$ value at median	%7742	\$3634	\$2844	\$3318

"a one-point increase in Massachusetts standardized test scores (less than one standard deviation) could lead to an increase in house values of close to \$70 million in the state" (578)... **NO!!!** prices were relative based on changing test scores; if all test scores go up, there's no change in relative scores so can't use results from this model for this

Good - Table IV (p591) lists magnitude of results

6. Does paper do a good job of testing theory?

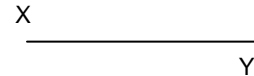
Are there serious flaws?

"popular literature suggests that parents do use test scores as a primary measure of school quality. Even if parents are not considering test scores specifically when evaluating a school but are instead looking at characteristics that are correlated with test scores, test scores will still be an appropriate measure" (583)... were houses bought by parents with elementary (or younger) aged kids?

How can the empirical work be improved?

Maybe focus on boundaries that aren't major highways or roads

House X and house Y are along same boundary, but not necessarily in same neighborhood; other ways to identify if houses are in same neighborhood: same builder, same subdivision, age of houses (should be close for same neighborhood), property appraiser identifies neighborhoods (Figlio did this last method)



Lott & Kenny: Did Women's Suffrage Change the Size and Scope of Government?

Voting Background

To simplify analysis, use dollar equivalents and assume citizens are risk neutral

Political Income - specified for citizen i under candidate A and candidate B:

$$M_{A,i}^* = M_i + \text{value of } G \text{ received under A} - \text{taxes under A}$$

$$M_{B,i}^* = M_i + \text{value of } G \text{ received under B} - \text{taxes under B}$$

Probability of Winning - probability that A wins if citizen i does not vote is p_A

Expected Political Income - if citizen i does not vote:

$$EM_{nv,i}^* = p_A \cdot M_{A,i}^* + (1 - p_A) M_{B,i}^*$$

Voting - alters probability that candidate A wins by $|\Delta p_A|$

$$\text{If } M_{A,i}^* > M_{B,i}^* \text{ vote for A} \Rightarrow \Delta p_A > 0$$

$$\text{If } M_{A,i}^* < M_{B,i}^* \text{ vote for B} \Rightarrow \Delta p_A < 0$$

Cost of Voting (C) - (1) value of time spend learning about candidate and voting; (2) out of pocket expenses (transportation, poll tax, etc.)

Expected Political Income - if citizen i does vote:

$$EM_{v,i}^* = (p_A + \Delta p_A) M_{A,i}^* + (1 - p_A - \Delta p_A) M_{B,i}^* - C$$

Better off voting if:

$$EM_{v,i}^* > EM_{nv,i}^*$$

$$(p_A + \Delta p_A) M_{A,i}^* + (1 - p_A - \Delta p_A) M_{B,i}^* - C > p_A \cdot M_{A,i}^* + (1 - p_A) M_{B,i}^*$$

$$\Delta p_A \cdot (M_{A,i}^* - M_{B,i}^*) > C$$

Benefit of voting > Cost of voting

Median Voter Theorem - both candidates go to the middle, in which case $M_{A,i}^* = M_{B,i}^*$, so no one would vote!

1. What is paper's contribution?

How does it push out frontier of knowledge?

"There is little evidence on how long it takes voter turnout to fully respond to an expanded voting franchise" (1189)

Filer, Kenny & Morton (1991) - poll tax repealed in 1964 still depressing turnout 16 years later; based on data from 4 elections (1948, 1960, 1968, 1980)... "inadequate to estimate how voting rates adjusted over time" (1189)

"Empirical literature on historical voter turnout, a literature that has been rather meager despite the many fundamental changes in voting regulations" (1189)

What do we know that we did not know before?

larger data set over longer period of time... biennial basis from 1870 to 1940 for 48 contiguous states

Is this important or minor? Why?

2. Theory:

State Dummies - "capture time-invariant cross-sectional differences in amenities, "tastes" for government, and institutional structure" (1173)

Year Dummies - "pick up changes over time in the relative price of government services, federal programs, national business cycle conditions, and "tastes" for government programs" (1173)

Dummies "may falsely cause us to attribute some changes in government growth to fixed effects that should be attributed to variables such as women's voting" (1173)

"Even small changes in the costs and benefits have sizable impacts on voter turnout" (1188)

Political Capital - knowledge about party positions and candidates that are acquired by individuals over time; increases the likelihood of voting

"the decisions to vote and acquire political knowledge are thus simultaneously determined" (1189)

1870-1908 mean for gov turnout was 32%... assuming women have same participation rate as men, expect gov turnout to rise to 59% after women given right to vote

Younger women should vote more: (1) bigger return for political capital, (2) don't have "habit" of not voting... test by breaking women in 3 groups: 21-44, 45-64, and older

3. Description of Variables

Gov Turnout - fraction of the total population aged 21 or older who voted in state's gubernatorial election

Female Suffrage x fraction of population over 21 that is female - Kenny: "if there are no women, allowing women to vote wouldn't affect turnout" (possible in frontier states where men outnumbered women 3 to 1... frontier states were the first to allow women to vote); this variable is used in first specification (regressions 2 & 5)

Female Suffrage x initial fraction of population over 21 that is female -

4. Sample:

Source:

Yearly Census data for

- Illiteracy rates
- Foreign-born population
- Male & female populations 21 and older
- % workforce in manufacturing
- Real manufacturing wage

Historical Statistics of the United States: Colonial Times to 1970 (Bureau of the Census 1975)

- Total population
- Rural and elderly populations
- Number of gainful female workers

data points:

36 Biennial years (1870-1940) for 48 states... infrequent elections and recent statehood reduced sample to 1,215 elections

Is sample appropriate or optimal for study?

5. Analysis

Statistical Technique

"Admittedly, there are many state-specific and year-specific differences in voter turnout rates that will not be captured by the variables that we control for and other differences that might affect the returns to voting over time"... deal with it by using state and time fixed effects

3 specifications:

1. simple dummy variable indicating whether poll tax was in effect and dummy for whether women were allowed to vote times fraction of population over 21 that is female
2. spline estimates piecewise-linear relationship between turnout and time since granting women's suffrage; allows for initial effect, then captures women's lag in taking advantage of right to vote

Female Suffrage: yrs 0-T

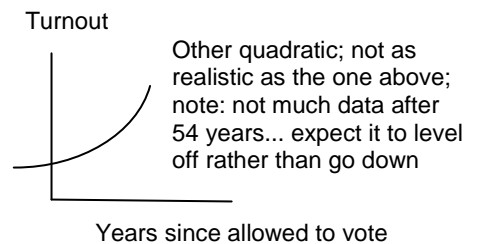
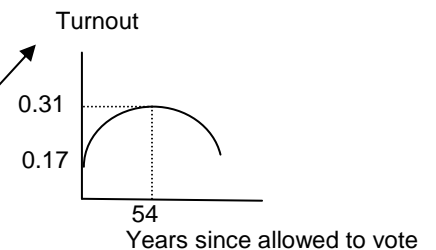
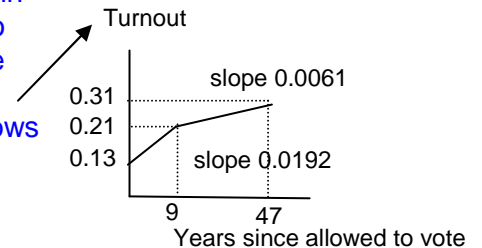
%female x years if yrs < T
%female x T if yrs > T (= 9)

Female Suffrage: yrs T+

%female x 0 if yrs < T
%female x (yrs - T) if yrs > T

3. quadratic time trend to estimate lagged response to granting of women's suffrage

Run these with and without state and time fixed effects for total of 6 regressions



Results

"Granting women the right to vote is estimated to increase voter turnout by 14-23 percentage points on average over the sample" (1191)

Regression 6... 40 years to get 32%

Spline results (regression 2 & 5)... 43 years to get 32% rise

Larger fraction of adult women who voted were 45-64

Turnout higher when there is more at stake (i.e. presidential election)

"positive coefficients on relative manufacturing wage lend some support to the rising of turnout with the stakes in the struggle over income distribution" (1195)

secret ballots reduced voting rates... required literacy; vote buying declined (can't enforce contract if you can't see who person votes for)

6. Does paper do a good job of testing theory?

Are there serious flaws?

Fixed effects not consistent - older voters less likely to vote; illiterate wrong sign (positive) and significant; real manufacturing wage not significant... less support from census variables; also literacy test has wrong sign... cause: state & time fixed effects are capturing most of the variation (part of problem was interpolating census data)... possible collinearity problem

How can the empirical work be improved?

Measure for closeness of election; also measure for closeness of presidential election

Evans & Harrigan: Distance, Time, and Specialization

1. What is paper's contribution?

How does it push out frontier of knowledge?

Redding & Venables (2001) - transportation costs increase in distance; "market access" motive leads to massing near source of final demand; factors of production that can't move will be paid less

Hummels (2001) - premium paid for air shipment exceeds interest cost savings on inventory in transit... "distinct from transport-cost-economizing motive emphasized in the economy geography literature"

Deardorff (2002) - covers same issues as this paper... assumes speed is capital intensive

Venables (2001) - discusses tradeoff between proximity and production costs; "technology that makes timely production easier will lead to production shifting closer to the enter" (2)... authors aren't very clear on what that means

What do we know that we did not know before?

Interaction of 2 (time and distance)

Trends in 1990 textile:

"Lean retailing" - information technology allowed retailers to hold small inventories to respond to fluctuations in consumer demand

Location - shift away from lower wage locations in Asia to higher-wage locations in Mexico and Caribbean

"Result of an increased demand for timeliness is that wages will be higher in locations near the source of final demand, with lower wage distant locations specializing in products where timeliness is less important." (1)

Is this important or minor? Why?

"One of a very few that study the importance of timeliness in determining trade patterns, and the first to build careful micro foundations for the demand for timeliness and provide empirical evidence on its importance" (2)

2. Theory:

"Assumption that distant production locations are sufficiently far away that shipping times are too long to meet the deadlines required by lean retailers" (3)

1. Optimal production for flexible and non-flexible firms separately (risk-neutral firm selling unique product)

Demand realized twice in year; nearby firms have option of producing twice; faraway plants can't

Inventory can be carried within a year at zero cost, but unsold inventory at end of year has price zero

Non-flexible firms produce twice expected optimal sales

2. Tradeoff between flexibility and costs

Assume cost of airfreight exceeds equilibrium wage savings from producing in Asia
Marginal firm is just indifferent between producing in A or C

3. Derive labor market equilibrium conditions

wage differential, $\hat{w} = b \left(\frac{L_A}{1+i_L-i_U} - \frac{L_C}{i_U-i_L} \right)$... function of country size (labor supplies L_A and L_C) and international pattern of specialization

4. Solve for equilibrium wages and pattern of specialization

Assume residents of A and C have no taste for apparel

Deardorff (2001) - autarky prices

"geography matters in our model... shipping takes time, which makes proximity valuable even though the cost of shipping (in the usual sense of a charge for moving goods) is zero." (10)

Results about geography come from model with no transport costs, no increasing returns, and no Dixit-Stiglitz preferences... "similar to von Thunen central place model, with the relatively transport-intensive goods locating near the exogenously given center, and wages declining with distance from the center, but our mechanism is wholly different" (11)

"Improvements in communications technology make distance matter *more* for incomes and trade in equilibrium, not less" (12)

Other explanations - comparative advantage (i.e., low wages for apparel) and trade policy NAFTA and Caribbean Basin Initiative (CBI) - by 1998, Mexico had very privileged access with virtually all apparel imports entering with at most nominal tariffs

"By the end of our sample in 1998, our model predicts that replenishment product categories will be sourced from countries near the US" (15)

3. Description of Variables

Proximity*Replenishment - measured by Mexico-Caribbean dummy multiplied by replenishment rate

Trade Barriers -

Country -

Product -

Import Growth % - not a good measure because it varies wildly; replaced with bounded import growth

Bounded Import Growth % -

Country -

Product -

** Authors didn't do a good job of identifying these **

4. Sample:

Source:

Multi Fiber Arrangement (MFA)... administered by division of Commerce Department called Office of Textiles and Apparel (OTEXA)

US Commerce Department, 10-digit HS level; includes info on import values, import quantities, tariffs, transport costs, and source country... aggregate up to OTEXA classification system

"unique, proprietary data source forma major department store chain"... includes which items were replenished and in what proportions

Item, # of reorders, country... aggregated items up to those tracked by OTEXA

Look only at periods where imports were unconstrained (i.e., quota is slack)

1991-1998... total growth over the 7-year period

data points:

3,177 total... 2,753 not quota constrained (can't measure replenishment of something you're not allowed to import more of)

Each data point is a reorder for a particular item for the department store chain... authors weren't very specific on this point (didn't mention # of different items or # of different countries)

Is sample appropriate or optimal for study?

Large time period with big changes... e.g., mean import growth is 6,763%!

Only using 1 department store chain

5. Analysis

Statistical Technique

Interaction effect between replenishment proportion and a dummy for proximity to the US (1 for Mexico and Caribbean counties)

Country dummies control for influences such as factor prices, country's average level of tariffs and quota restrictiveness and other country-specific effects

Product dummies account for average rate of growth of imports in the category

Use "bounded" import growth (used by Davis, Haltiwanger & Schuh (1996))

OLS, White heteroskedasticity-consistent, and bootstrap; also iterative weighted least squares

Results

Trade with nearby countries grew 70% faster for high-replenishment produces also grew 25% faster for other goods

Test robustness several ways - different types of standard errors (robust & bootstrap); different regressions to put less weight on outliers

6. Does paper do a good job of testing theory?

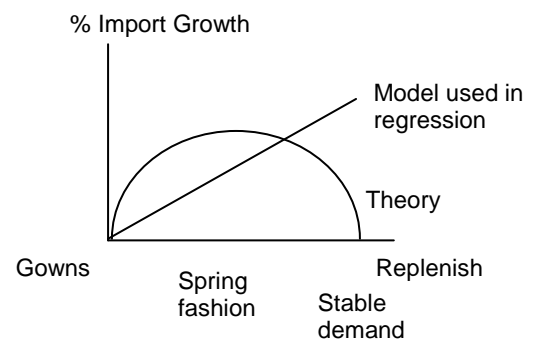
Are there serious flaws?

Long, stable demand with low replenishment (e.g., men's underwear); not captured in empirical analysis... could capture with quadratic term, but need to make sure data incorporates these items

How can the empirical work be improved?

Spends lots of time developing theory and talking about how smart they are, but barely discuss the formulation of the empirical work

Didn't use wage data... Kenny: "very hard to get decent wage data from multiple countries"



Madsen: Trade Barriers and the Collapse of World Trade During the Great Depression

Quote for the course: "OLS estimates do not uncover causality but only the correlation between variables, it is not clear the extent to which [MaGee, Brock & Young's] estimates give support for the endogenous tariff theory" (865)

1. What is paper's contribution?

How does it push out frontier of knowledge?

Pollard (1962) - "fall in total foreign trade... may well not have been caused by the tariff as such"

Khan (1946) - UK nominal imports from Europe and the US were reduced by 60% "as a result of the tariff"

Saint-Etienne (1984) - international trade had become barter trade as a result of the tariffs and nontariff barriers

Empirical studies:

Crucini and Kahn (1996) and **Irwin** (1998) - tariffs were influential for US imports and exports

Friedman (1974) - trade restrictions had a significant impact on trade

Eichengreen and Irwin (1995) - "most extensive analysis of trade flows in the interwar period"; 561 cross-sectional bilateral trade flows over three periods (1928, 1935, 1938); relate value of bilateral flows to national income, population, distance, contiguity, trade and currency block indicators, and exchange rate variability; attribute declining marginal propensity to import and export to quotas and other binding trade retractions

Friedman (1974) and **Jones** (1934) - Hawley-Smoot Tariff Act of 1930 led to "concerted worldwide retributions against U.S. exports and escalations of trade barriers that were not specifically targeted at U.S. products" (850)

Gardner and Kimbrough (1990) - "countries have little to gain from country-specific tariffs and that all trading partners are affected by country-specific tariffs, not only the nations that are targeted" (851)

Goldstein and Khan (1985) - exchange uncertainty did not influence world trade in postwar period

"Some economists argue that the US tariff escalations adversely affected income, thus implying that a larger proportion of the trade collapse should be attributed to the escalations of the trade barriers... Proponents of endogenous tariff policies claim that it is the other way around, namely that the rising tariffs were to a large degree endogenous responses to the increasing unemployment" (865)

MaGee, Brock & Young (1989) - 75% variation of US macros tariff rate from 1900-1982 can be explained by endogenous tariff variables (rate of unemployment, inflation, and terms of trade)

What do we know that we did not know before?

"Estimate the contribution of income, tariffs, and nontariff barriers on world trade during the Depression using panel data for 17 countries over the period from 1920 to 1938. The panel data approach enables the assessment of the influence on trade of nontariff barriers from estimates of import and export functions" (849)

Is this important or minor? Why?

2. Theory:

World import/export volume decreased 30% between 1929 and 1932

$$\Delta q_{it}^{\text{ex}} = \gamma_0 + \gamma_1 \Delta(p_{it}^{\text{d,ex}} - p_{it}^{\text{w,ex}}) + \gamma_2 \Delta y_{it}^{\text{w}} + \gamma_3 \Delta \log(1 + tr_{it}^{\text{ex}}) + \gamma_4 \Delta \sigma_{it}^{2,\text{xr}} + \text{TD}_t \zeta^{\text{ex}} + \text{CD}_i \zeta^{\text{ex}} + \varepsilon_{it}^{\text{ex}}$$

$$\Delta q_{it}^{\text{im}} = \lambda_0 + \lambda_1 \Delta(p_{it}^{\text{d}} - p_{it}^{\text{w,im}}) + \lambda_2 \Delta y_{it}^{\text{d}} + \lambda_3 \Delta \log(1 + tr_{it}^{\text{im}}) + \lambda_4 \Delta \sigma_{it}^{2,\text{mr}} + \text{TD}_t \zeta^{\text{im}} + \text{CD}_i \zeta^{\text{im}} + \varepsilon_{it}^{\text{im}}$$

$i = 1, 2, \dots, 17$; $t = 1922, 1923, \dots, 1939$

q_{it}^{ex} = log of export volume (weight)

$p_{it}^{\text{d,ex}}$ = log of export unit values of domestic producers in US dollars

$p_{it}^{\text{w,ex}}$ = log of competitors' prices in the export markets (US\$)

$\Delta(p_{it}^{\text{d,ex}} - p_{it}^{\text{w,ex}})$ = expect negative coeff... if domestic producers prices rise (with competitors' constant), expect to sell fewer exports... result: negative and significant (same for previous years' which is smaller in absolute value)

y_{it}^{w} = log of trade-weighted real GDP... weighted average of GDP for countries that are exported to... expect positive coeff (if other countries have more income, they'll buy more imports); coeff is income elasticity of exports... result: positive and significant

tr_{it}^{ex} = trade-weighted export macro tariff rate (decimal)... weighted average of tariffs charged by countries exporting to

$\Delta \log(1 + tr_{it}^{\text{ex}})$ - change from year to year; expect coeff to be negative (higher tariffs mean fewer exports)... result: negative and significant

q_{it}^{im} = log of import volume (weight)

p_{it}^{d} = log of producer prices of domestic producers (US\$)

$p_{it}^{\text{w,im}}$ = log of import unit values (US\$)

$\Delta(p_{it}^{\text{d}} - p_{it}^{\text{w,im}})$ = expect positive coeff... if domestic producers prices rise (with competitors' [importers'] constant), expect to buy more imports... result: positive and significant

y_{it}^{d} = log of domestic real GDP

Δy_{it}^{d} = expect positive coeff... have more income, buy more stuff (including imports)... result: positive and significant

tr_{it}^{im} = tariff rate on imports (decimal)

("macro tariff rates are measured as import duties divided by nominal imports")

$\Delta \log(1 + tr_{it}^{\text{im}})$ = expect negative coeff... if import tariffs increase (all else equal), expect fewer imports... result: negative and significant

$\sigma_{it}^{2,\text{xr}}$ and $\sigma_{it}^{2,\text{mr}}$ are monthly variances of bilaterally trade-weighted exchange rates for exports and imports, respectively

$\text{TD}_t = N \times (T - 3)$ matrix of time dummies ($N = \#$ countries = 17; $T =$ length of time)

$\text{CD}_i = N \times (N - 1)$ matrix of country dummies

"Time dummies... as assumed to capture the impact on trade of nontariff barriers such as quota systems, limitations on the use of imported raw materials by domestic producers, misused controls at frontiers, and regulation and rationing of foreign exchange" (852)... "also likely to enable a better identification of the income elasticities" (855)

Good?

- 1) "if export function is correctly specified, then the time dummies will capture the effects on an omitted variable that follows the same time path across nations, namely nontariff barriers" (359)
- 2) "tariff rates were highly correlated over time across countries and no individual country effects could be determined"; **Svenska Handelsbanken** (1933) - nontariff barriers were imposed almost simultaneously across countries, during the first years of the Depression

Convincing? - time dummies can be picking up anything that is omitted

"Export price competitiveness is calculated as a multilateral index... fact that exporters not only compete with producers in the market of destination... but also compete with third-market producers who export to the same market" (854)

$$p_{it}^d = p_{it}^{w,ex} = PW'$$

P is $N \times T$ matrix consisting of export unit values for country i at time t denominated in US\$ and normalized to have mean 1 over period 1920-1939

W is $N \times M$ weighted matrix of N suppliers of exports to M markets... the X_{ij} elements are not available... estimated by nominal GDP/2

26 countries included in the index

3. Description of Variables

4. Sample:

Source:

17 Countries: Canada, U.S., Japan, Australia, New Zealand, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Sweden, Switzerland, and UK
export and import volume measured as total weight of imports and exports

data points:

Says 17, then 26 countries

19 years (1923-1937)

Is sample appropriate or optimal for study?

"Panel data nature of the estimates not only overcomes the small sample problems that are associated with single country estimates... it also enables a quantification of the effects on trade of the imposition of nontariff barriers." (851)

5. Analysis

Statistical Technique

Pooled cross-section and time-series analysis

Generalized instrumental variable estimator... "error terms are assumed to be contemporaneously correlated across countries, as the countries have been exposed to shocks that affected all countries simultaneously" (855)

Instruments - relative price variables: $p_{it}^d = p_{it}^{w,ex} = PW^i$

Uses $\Delta(p_{it}^{d,ex} - p_{it}^{w,ex})$, $\Delta(p_{it-1}^{d,ex} - p_{it-1}^{w,ex})$, y_{it}^w , y_{it-1}^w , $\Delta \log(1 + tr_{it}^{ex})$, $\Delta \log(1 + tr_{it-1}^{ex})$, q_{it-1}^{ex} , and ΔCPI as instruments... Kenny: there's no new information other than CPI; everything depends on lagged values; not very good instrumenting

Leamer's (1978) formula to calculate critical values of diffuse priors (accounts for likelihood of rejecting null hypothesis growing with sample size)

Results

World trade collapse... 41% imposition of discretionary barriers; 59% decreasing nominal income... assuming independence between nominal income and tariffs

Real world trade contracted because:

13-14% declining income

8% discretionary increases in tariff rates

5% deflation-induced tariff increases

6-7% imposition of nontariff barriers

"Allowing for feedback effects from trade barriers on income and prices, discretionary impositions of trade barriers contributed about the same to the trade collapse as the diminishing nominal income." (848)

"null hypothesis of coefficient constancy with breaking point in 1930/1931 cannot be rejected at conventional significance levels, which suggests that the equations are well specified" (857)

"estimated income elasticity is substantially higher in the pre-Depression period than during the Depression when the time dummies are excluded... which suggests that the estimated income elasticities are biased in estimates that exclude time dummies because income and nontariff barriers are contemporaneously correlated" (857)

"null hypothesis of cross-country coefficient homogeneity cannot be rejected at conventional significance levels" (857)

"Tariff elasticities are approximately twice as high as the estimated long-run price elasticities and are statistically highly significant" (858)

"Imports appear to be more adversely affected by nontariff barriers than exports during the Depression" (858) **how is this possible?**

"Similarities of the time profiles of the estimated coefficients of the time dummies and the world tariff rate in Figure 1 are remarkable... giving further credibility to the hypothesis that the time dummies capture the effects of nontariff barriers." (859)

6. Does paper do a good job of testing theory?

Are there serious flaws?

How can the empirical work be improved?

Doesn't address problems with aggregating data

"insignificant... at the 5% level... were consequently omitted from the estimates" (855)... omitted from regression or not reported in the table?

R^2 are > 0.95 ... picking up a lot of the variation... hard to believe it's only three things (tariffs, income, and nontariff barriers that explain everything)

Imports & Exports are simultaneously determined

Zhang: Public College Quality and Higher Education Policies of US States

1. What is paper's contribution?

How does it push out frontier of knowledge?

"No clear measures of college quality exist" (1)

McPherson, et al (1993) and **Dynarski** (2002) - review studies on how federal and state aid policies affect college access and choice

Kane (1994) - finds increases in tuition have driven enrollment rates by blacks downward throughout the 80s

Fortin (2003) - higher average tuition in a state's public colleges leads to lower enrollment rates in public colleges from 70s to 90s.

Long (2003) - format of state subsidies on higher education; in-kind subsidies induce students to choose public over private; grant aid has opposite affect

In-kind - e.g. free room & board; subsidized housing

Grant - money to pay for whatever you want

"Control for unobservable individual characteristics that affect both the college choice and future earnings in the labor market... those who choose more selective colleges tend to have certain characteristics that will lead to higher earnings in the labor market, irrespective of the college they attend" (5)

Brewer and Ehrenbert (1996) - review 15 studies on college contribution to future earnings... none of them attempted to control for self-selection issue

Behrman et al (1996), **Brewer and Ehrenberg** (1996), **Brewer** et al (1999) - find that more selected colleges have higher value-added to future earnings and value-added is smaller when self-selection is controlled for

Problems - (1) few categories conceals tremendous heterogeneity across colleges within each category, (2) selectivity index represents only one of many college characteristics (missing peer group quality, physical facilities, etc.)

Dale and Krueger (2002) - peer quality does not affect future earnings while tuition and expenditure per student have positive effect

Problems - only 30 highly selective colleges is not representative

What do we know that we did not know before?

"None of the previous studies have been able to control for fixed effects of local labor markets" (6)

"Previous studies lump private and public institutions, making any of the implications less relevant to state policy makers" (6)

Is this important or minor? Why?

2. Theory:

Measures of States' generosity:

In-kind support

State appropriations

Tuition charges

Expenditure per student

Openings available

Want to control for:

Students' precollege achievement

Labor market experience

"Earnings itself is a measure gross of precollege academic preparation, family influence, and labor market experiences" (5)

Selectivity Measures

State Average Selectivity Index - calculated as FTE students weighted average of Barron's indices for each public school in state (value 1 to 6); divide into 2 categories: High Quality - for "most competitive," "highly competitive," and "very competitive" (Barron's 6, 5, 4)

Low Quality - for "competitive," "Less competitive," and "noncompetitive" (Barron's 3, 2, 1)

Problem... what about comment about too few categories

% FTE students in high quality schools as ratio of total FTE students in public colleges in the state

Aitkin and Longford (1986) and Hanushek (1979) - "to isolate the contribution of state of college to earnings, it is important to adequately control for differences in both the pre-college achievement and the labor market experience" (10)

$$y_{ijkl} = \beta_0 + \beta_1 X_{ijkl} + \beta_2 F_{ij} + \beta_3 S_{ik} + \beta_4 R_{il} + \varepsilon_{ijkl}$$

Individual i , School in state j , College in state k , living in region l

y_{ijkl} = natural log of annual earnings

X_{ijkl} = individual and family characteristics to control for pre-existing differences in academic preparation

F_{ij} = vector of high school state primary and secondary school characteristics

S_{ik} = dummy variables for state college

R_{il} = dummy variables for region of current residence

Goal of study is to determine β_3

Selection into State Public College - simultaneous college decision; whether to go to private or public college and in which state to go to public college... **Heckman (1979)**, probit choice equation between public and private colleges

"these qualities may also help them succeed in their careers regardless of the college they attended. I use instrumental variables to account for this endogeneity" (12)

Selective Migration - return to average individual educated in state k and working in region l

$$\bar{y}_{kl} = \mu + \beta_{3k} + \beta_{4l} + \delta_{kl}$$

β_{3k} = state of college fixed effect

β_{4l} = region of residence fixed effect

"distance between the capitals of one's state of college and state of current residence"....

Problem... why capitals?

Problem... doesn't capture "idiosyncratic taste for the destination region, such as preferences for weather or cultural atmosphere"

State College Quality - use probit model on school choice and inverse Mill's ratio

Mill's Ratio - allows you to explicitly deal with the endogeneity of the school-choice issue... it's insignificant in the wage equation \therefore the endogeneity problem doesn't exist (or isn't a big deal; although it could be a problem with the probit model rather than with endogeneity)

3. Description of Variables
See Table 3

4. Sample:

Source:

Baccalaureate and Beyond (BB) Longitudinal Study - individual level info concerning education and working experience after completion of bachelor's degree... 11,000 students graduated 1992-1993 academic year (entered college 1988 or 89); follow up surveys in 1994 & 1997

Initial: demographic characteristics, college admission test scores, college GPA, information on parental schooling and family income

Follow up: employment history and earnings after degree

Integrated Postsecondary Education Data System (IPEDS) - information on postsecondary institutions within the US... financial revenues and expenditures, tuition cost, enrollment, faculty salary... used data from 1988-1989 (salaries from 1989-90)

Barron's (1988) - Carnegie classification indices for competitiveness, median test scores of student body and measure of faculty quality (% with doctoral degree)

US Census Bureau - state level information (population, income, geography)

NCES (1998) - info on state primary and secondary education system

NASSGAP (1995) - info on state higher education characteristics (by aggregating institution level data)

data points:

Limit data to students who:

Did initial and second follow up surveys

Worked in US

Not full time student

Age 24-35

Annual earnings > \$5000..... "about 6,000 students" 5818... used in Probit (self-selection)

Also limit to public college... "almost 70%"... 3995 public; 1823 private

Is sample appropriate or optimal for study?

"BB data set suits particularly well the present study since it contains complete information on individuals' geographic locations at high school, college, and employment, allowing me to isolate different state fixed effects" (7)

5. Analysis

Statistical Technique

Probit to get IV,

IV without adjusting for college type selection, Heckman two-step method without adjusting for college location selection, and OLS

Results

"states with higher faculty quality and with more quality differentiation among public institutions generate higher value-added to student earnings, whereas more expenditure per student does not appear to promote higher performance." (1)

"Signs of almost all the control variables are consistent with expectations. Individuals having higher SAT score, higher parental income, more work experience, and having traveled longer distance to a labor market earn significantly more than otherwise identical individuals" (16)

"Wald test of equality of value-added by different state public higher education systems can be rejected at the 1% significance level" (17)

"estimated quality measure are not highly correlated with selectivity indices based on Barron's. This suggests that more selective colleges may not add much more to the students' earning power" (18)

Earnings peak... $\frac{\partial \ln w}{\partial \text{exp}} = 0.091 - 2(0.006)\text{exp} = 0 \Rightarrow 8 \text{ years after school... doesn't seem plausible (typically peak 30-35 years after leaving school)}$

6. Does paper do a good job of testing theory?

Are there serious flaws?

Students only 4 years out of college... would be better to have longer period between graduation and work experience (10 or 15 years)

Demographic data (ethnicity and gender) used in Probit and Wage equation... no economic reason for these variables to have an impact on school selection

Keeping data with No SAT/ACT score... keeps data which may help estimates for other coefficients, but could be problematic as well (ditto for no father's or mother's education)

Many variables being used to possibly capture the same thing (e.g., parental influence [education, etc] is correlated with test score... why include both in regression for school choice?)

Need based aid/FTE... does it also cover private tuition? (only way negative coeff makes sense); does it vary by state? (if so it's not worth using)

Mixing choice models... students choose school, but school slots are limited... should be consistent in argument; if it's a rationing method, then describe other variables in terms of rationing (not student choice)

Wage model uses age and experience... probably measuring same thing

Kenny: specification issues may not be simple

Multiple measures of faculty quality... better options: average class size; % classes taught by graduate students

% PhD is crude... most schools require them; maybe look at Nobel prize or publication rankings (although some schools won't even show up)

Research vs. teaching schools?

Not the best sample... too broad a range; might be better to look at individual schools not entire states (e.g., FL has 10 state universities)