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

\[ \Delta q_{t}^{\text{exe}} = \gamma_{0} + \gamma_{1}\Delta(p_{t}^{\text{dex}} - p_{t}^{\text{w,ex}}) + \gamma_{2}\Delta y_{t}^{\text{w}} + \gamma_{3}\Delta\log(1 + tr_{t}^{\text{ex}}) + \gamma_{4}\Delta\sigma_{t}^{2,\text{xe}} + \text{TD}_{t}\xi_{t}^{\text{ex}} + \text{CD}_{t}\zeta_{t}^{\text{ex}} + \epsilon_{t}^{\text{ex}} \]

\[ \Delta q_{t}^{\text{im}} = \lambda_{0} + \lambda_{1}\Delta(p_{t}^{\text{dim}} - p_{t}^{\text{w,im}}) + \lambda_{2}\Delta y_{t}^{\text{d}} + \lambda_{3}\Delta\log(1 + tr_{t}^{\text{im}}) + \lambda_{4}\Delta\sigma_{t}^{2,\text{mr}} + \text{TD}_{t}\xi_{t}^{\text{im}} + \text{CD}_{t}\zeta_{t}^{\text{im}} + \epsilon_{t}^{\text{im}} \]

\[ i = 1,2,\ldots,17; \quad t = 1922,1923,\ldots,1939 \]

- \( q_{t}^{\text{exe}} \) = log of export volume (weight)
- \( p_{t}^{\text{dex}} \) = log of competitors' prices in the export markets (US$)
- \( \Delta(p_{t}^{\text{dex}} - p_{t}^{\text{w,ex}}) \) = 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)
- \( y_{t}^{\text{w}} \) = 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
- \( tr_{t}^{\text{ex}} \) = trade-weighted export macro tariff rate (decimal).... weighted average of tariffs charged by countries exporting to
- \( \Delta\log(1 + tr_{t}^{\text{ex}}) \) = change from year to year; expect coeff to be negative (higher tariffs mean fewer exports)... result: negative and significant

- \( q_{t}^{\text{im}} \) = log of import volume (weight)
- \( p_{t}^{\text{dim}} \) = log of producer prices of domestic producers (US$)
- \( \Delta(p_{t}^{\text{dim}} - p_{t}^{\text{w,im}}) \) = expect positive coeff... if domestic producers prices rise (with competitors' [importers'] constant), expect to buy more imports... result: positive and significant
- \( y_{t}^{\text{d}} \) = log of domestic real GDP
- \( y_{t}^{\text{d}} \) = expect positive coeff... have more income, buy more stuff (including imports)... result: positive and significant
- \( tr_{t}^{\text{im}} \) = tariff rate on imports (decimal)
- (“macro tariff rates are measured as import duties divided by nominal imports”)
- \( \Delta\log(1 + tr_{t}^{\text{im}}) \) = expect negative coeff... if import tariffs increase (all else equal), expect fewer imports... result: negative and significant

\( \sigma_{t}^{2,\text{xe}} \) and \( \sigma_{t}^{2,\text{mr}} \) 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 \( (N = \# \text{ countries} = 17; \quad T = \text{length of time}) \)
\( \text{CD}_{t} = N \times (N - 1) \) 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)

\[ p'_{it} = p'_{w,ex} = PW' \]

\( P \) is N x 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 x 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: $p^d_{it} = p^{w,ex}_{it} = PW'$

Uses $\Delta(p^{d,ex}_{it} - p^{w,ex}_{it})$, $\Delta(p^{d,ex}_{it-1} - p^{w,ex}_{it-1})$, $y^w_{it}$, $y^x_{it}$, $\Delta \log(1 + t^{ex}_{it} x)$, $\Delta \log(1 + t^{ex}_{it-1} x)$, $q^{ex}_{it-1}$, and $\Delta CPI$ 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)  
   **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)

\[
y_{ijkl} = \beta_0 + \beta_X X_{ijkl} + \beta_F F_{ij} + \beta_S S_{ik} + \beta_R R_{il} + \epsilon_{ijkl}
\]
Individual \(i\), School in state \(j\), College in state \(k\), living in region \(l\)
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 \(\beta_3\)

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 \(l\)
\[
\bar{y}_{kl} = \mu + \beta_{3k} + \beta_{4l} + \delta_{kl}
\]
\(\beta_{3k}\) = state of college fixed effect
\(\beta_{4l}\) = 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 base don Barron's. This suggests that more selective colleges may not add much more to the students' earning power"  (18)

Earnings peak.... \[ \frac{\partial \ln w}{\partial \exp} = 0.091 - 2(0.006)\exp = 0 \] \Rightarrow 8 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)