An Investigation into Trade Biases in Agriculture

Matthew Hink
Department of Agribusiness and Agricultural Economics
University of Manitoba

Presented at
CATPRN 2011 Annual Workshop
Toronto, Ontario
May 28, 2011

Introduction

- Limao & Panagariya (2007)
  - Recent example of modification to "Protection for Sale" (G&H, 1994)
  - Attempt to explain anti-trade bias
- Introduces motive of reducing inequality among sectors
- We want to assess the validity of this model empirically

Outline

- Background of the theory
- L&P
- Our econometric model
- Data and variable calculation methods
- Static model results
- Conclusion

Background

- Grossman & Helpman (1994)
  - Models effects of political weights
  - More weight for industries which spend more on lobbying
- Touchstone article upon which much of recent research on political economy of trade has been based

Background (Cont'd)

- Levy (1999) suggests G&H predicts pro-trade bias
  - Contrary to observed trade policies in agriculture
- Political weight is based on level of lobbying
  - Greater income share means more lobbyist spending
  - Exporters predicted to have greater income share in G&H framework
    - Want pro-trade bias

The L&P Model

- Limao and Panagariya (2007)
  - Political weight not based solely on lobbyist spending
  - Weight based on motive to reduce/eliminate income inequality between sectors
  - Import-competing sector predicted to have smaller income share (more often)
  - Government protects import-competing sector to reduce inequality

What L&P model suggests

- Direction of support is dependent upon what type of policy will reduce inequality
- More one-sided support when inequality is greater
- Anti-trade bias when import-competing goods have lower income share
- Pro-trade bias when exporting goods have lower income share

Empirical Application

- Estimate reduced form model
  - Structural model requires many unobservable variables and elasticities
  - Use of panel data allows for control of unobservables
- Will test correlation between sectoral income inequality and trade bias
- Agricultural data will be used
  - Tend to observe higher levels of support in agriculture
- Two sectors are import-competing and exporting
  - Based on trade status as defined in World Bank database

Econometric Model

$$TB_{it} = \alpha_0 + \alpha_1 Ineq_{it} \cdot MSmall_{it} + \alpha_2 Ineq_{it} \cdot XSmall_{it} + \alpha_N X_{it} + \varepsilon_{it}$$

- *TB* : level of trade bias
- Ineq: level of inequality between sectors
- *MSmall,* XSmall: Dummies for which sector has smaller income share
- X: Control variables

Data

- Core data including TB, inequality, production values, WRI from World Bank database
  - *Distortions to Agricultural Incentives*
- Over 70 countries, 6 continents
- Data ranges back as far as mid-1950s

Estimation

- Starting with static, fixed effects panel model
- Inequality, many control variables lagged with 5 year moving average
  - Endogeneity concerns

Trade Bias

- Measures amount of assistance (NRA) to export goods relative to import goods

$$TB_{it} = \left[\left((1 + NRA\_X_{it}) \Big/ (1 + NRA\_M_{it}) \right) - 1 \right]$$

- NRAs are weighted averages of assistance to each covered product
- Capture support through border price controls, direct producer support, and support to inputs
- Positive when exports are more heavily supported and vice versa

Inequality

- Measure of relative production value of exporting and import-competing goods, normalized by overall production value

$$INEQ_{it} = \frac{X_{it} - M_{it}}{Val_{it}}$$

- Greater gap = greater inequality
- Positive if import-competing goods smaller, vice versa
- Normalized to control for variability of ag production, and to give a rate of inequality
- Since only two values being compared, simple measure is sufficient

Summary Statistics

- Show negative trade bias, positive inequality, on average
  - In line with notions behind the model

Coefficient Hypotheses

Variable	Expected Sign
Inequality when Import-Competing Sector Smaller	Negative
Inequality when Exporting Sector Smaller	Negative
Welfare Reduction Index	Ambiguous
Signatory to WTO/GATT	Ambiguous
Herfindahl Index – Import-Competing Sector	Negative
Herfindahl Index – Exporting Sector	Positive
Share of World Imports	Negative
Share of World Exports	Positive
Signatory to PTAs	Ambiguous, Likely Positive
Time Trend	Positive

Static Model Results

Note: One asterisk denotes significance at 10% level, two asterisks denote significance at 5% level

Variable	Coefficents (Standard Errors)
Inequality, M smaller, Developing	-0.164* (0.088)
Inequality, X smaller, Developing	-0.196* (0.113)
Inequality, M smaller, Developed	0.539** (0.205)
Inequality, X smaller, Developed	-0.066 (0.102)
WRI	-0.000 (0.001)
WTO/GATT	-0.094** (0.036)
Herfindahl, Import-Competing	0.137 (0.093)
Herfindahl, Exporting	-0.062 (0.060)
Import Share	3.796** (0.967)
Export Share	-1.415 (1.062)
CAP	-0.119** (0.035)
NAFTA	-0.081 (0.051)
MERCOSUR	0.153** (0.064)
ANDEAN	0.037 (0.063)
ASEAN	-0.095** (0.045)
Year	0.001 (0.001)
Constant	-0.199** (0.087)

Results (Cont'd)

Variable	Result
Inequality, M smaller, Developing	-, Weakly Significant
Inequality, X smaller, Developing	-, Weakly Significant
Inequality, M smaller, Developed	+, Significant
Inequality, X smaller, Developed	-, Insignificant
WRI	-, Insignificant
WTO/GATT	-, Significant
Herf., M Sector	+, Insignificant
Herf., X Sector	-, Insignificant

Variable	Result
Import Share	+, Significant
Export Share	-, Insignificant
CAP	-, Significant
NAFTA	-, Insignificant
MERCOSUR	+, Significant
ANDEAN	+, Insignificant
ASEAN	-, Significant
Year	+, Insignificant

Dynamic Model

- We suspect the process may be dynamic
  - Intuitively, high correlation between current and past levels of trade bias
- Preliminary dynamic empirical results suggest this may be true
- Needs to be refined econometrically

Conclusion

- Want to empirically assess L&P's work
- Test hypothesis that inequality level is negatively correlated with trade bias
- Using World Bank panel dataset corresponding to over 70 countries, dating back in some cases to the mid-1950s
- Static results provide mixed empirical support for L&P's theory

Acknowledgements

- Canadian Agricultural Trade Policy Research and Competitiveness Network
- University of Manitoba
  - University of Manitoba Graduate Fellowship
- Province of Manitoba
  - Manitoba Graduate Scholarship