An Investigation into Trade Biases in Agriculture

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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

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

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

- *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
- Dynamic model
  - System GMM
    - Arellano–Bover (1995)/Blundell–Bond (1998)

Trade Bias

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

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

- 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

Summary Statistics

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

Coefficient Hypotheses

Variable	Expected Sign
Lagged Trade Bias	Positive
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
Urbanization	Ambiguous
Time Trend	Positive

Static Model Results

Note: * denotes significance at 10% level,
** denote significance at 5% level

Variable	Coefficents (Standard Errors)
Inequality, M smaller, Developing	-0.164*
	(0.089)
Inequality, X smaller, Developing	-0.196
	(0.120)
Inequality, M smaller, Developed	0.538**
	(0.204)
Inequality, X smaller, Developed	-0.067
	(0.102)
WRI	-0.000
	(0.001)
WTO/GATT	-0.094**
	(0.035)
Herfindahl, Import-Competing	0.138
	(0.094)
Herfindahl, Exporting	-0.063
	(0.059)
Import Share	3.740**
	(1.171)
Export Share	-1.412
	(1.059)
CAP	-0.118**
	(0.035)
NAFTA	-0.080
	(0.049)
MERCOSUR	0.151**
	(0.070)
ANDEAN	0.035
	(0.065)
ASEAN	-0.097**
	(0.048)
Year	0.001*
	(0.001)
Urbanization	0.000
	(0.002)
Constant	-0.209
	(0.130)

Static Results (Cont'd)

Variable	Result
Inequality, M smaller, Developing	-, Weakly Significant
Inequality, X smaller, Developing	-, Insignificant
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
Urbanization	+, Insignificant
Year	+, Weakly Significant

Dynamic Model Results

Note: * denotes significance at 10% level,
** denote significance at 5% level

Variable	Coefficents (Standard Errors)
Lagged Trade Bias	0.427**
	(0.080)
Inequality, M smaller, Developing	-0.200**
	(0.073)
Inequality, X smaller, Developing	-0.245**
	(0.091)
Inequality, M smaller, Developed	0.276**
	(0.106)
Inequality, X smaller, Developed	-0.140*
	(0.072)
WRI	-0.000
	(0.000)
WTO/GATT	-0.045
	(0.042)
Herfindahl, Import-Competing	0.217**
	(0.089)
Herfindahl, Exporting	-0.148**
	(0.059)
Import Share	0.365
	(0.485)
Export Share	-0.053
	(0.402)
CAP	0.017
	(0.042)
NAFTA	-0.090*
	(0.046)
MERCOSUR	0.197**
	(0.095)
ANDEAN	0.015
	(0.093)
ASEAN	-0.117
	(0.105)
Year	0.001
	(0.001)
Urbanization	0.001
	(0.001)
Constant	-0.177
	(0.120)

Dynamic Results (Cont'd)

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

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

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
- Dynamic results strengthen significance of key variables, but follow similar pattern
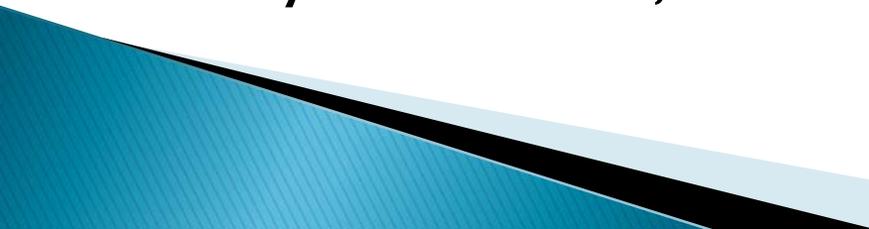
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