

Trade Policy and the Structure of Supply Chains

Sebastian Heise Justin Pierce Georg Schaur Peter Schott

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Discussion by: Teresa Fort
Tuck @ Dartmouth

Big Picture Questions

- Offshoring and global value chains important and growing
- How do firms structure their sourcing relationships?
 - ▶ American style: low price plus monitoring
 - ▶ Japanese style: high price with repeated interactions
- What is the effect of trade policy on these relationships?
 - ▶ Reduction in uncertainty between U.S. and China
 - ▶ Impact on types of relationships
 - ▶ Impact on prices and welfare

Main Contributions

- Model of sourcing style with trade policy
- Reduced-form evidence on sourcing styles
 - ▶ American vs. Japanese
 - ▶ Impact of reduction in policy uncertainty
- Structural estimates of effects uncertainty has on welfare
 - ▶ More long-term, Japanese-style relationships
 - ▶ Lower input costs

Model overview

- N countries with consumers with Dixit-Stiglitz preferences over a continuum of varieties indexed by j
- Buyers/importers
 - ▶ Perfect competition
 - ▶ Source domestically or offshore
- Suppliers can exert costly effort to produce high quality good
- Buyers choose supplier/system to minimize cost
 - ▶ Japanese: efficiency price and repeated interactions
 - ▶ American: lowest cost supplier and costly inspections
 - ▶ Choose: 1) optimal order size and number of shipments; 2) optimal system
 - ▶ Lowest cost supplier per product and period
- Infinitely repeated, static equilibrium

Model predictions

- Optimal shipment size larger under AS
 - ▶ Fixed cost to inspect independent of quantity
 - ▶ Inspection cost depends on product complexity
- AS always chosen when inspections costs are zero/low
 - ▶ Quality perfectly observable
 - ▶ Perfect mapping between effort and quality
- Increase in probability of trade peace leads to
 - ▶ Decreased costs of JS sourcing
 - ▶ Increase in optimal order size under JS (no effect on AS)
- More supplier switching under the AS
 - ▶ No value to repeated interactions under AS
 - ▶ Fixed cost of switching only under JS
- Trade costs are all fixed

New descriptive statistics on sourcing styles

- Construct importer-product-country-mode bins
- Classify as AS if $\Sigma \#suppliers / \Sigma \#shipments > 90^{th}$ ptile
 - ▶ Percentiles of suppliers/shipment within product-mode pairs
 - ▶ In model, importer sources each product from lowest-cost supplier
 - ▶ Expect more switching over time in AS
- Show that VPS and WBS higher for AS imports, while P lower

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- Show that VPS and WBS higher for AS imports, while P lower
- But, do relationship length predictions hold?
- Other determinants of the number of suppliers per buyer?
 - ▶ Risk diversification (more buyers for larger, less frequent orders)
 - ▶ Customization (fewer buyers and more frequent/smaller orders)
 - ▶ IP protection concerns (more relevant for longer product life-cycles)
- More convincing to use time series variaion in SPS counts

Want more information on sourcing styles!

- How much trade occurs via JS and AS
 - ▶ JS in pre-PNTR: 4.4% for China, 8.6% for World, 11.1% for Japan
 - ▶ How much does AS constitute?
 - ▶ How do these quantities change over time?
- How do average product characteristics differ by type?
 - ▶ Customized versus not? (Nunn share of differentiated inputs; Fort share of plants purchasing CMS; Rauch indicator of how sold)
 - ▶ Potential for quality differences? (Khandelwal quality ladders)
- How do average country characteristics differ by type?
 - ▶ Trust (as in Bloom et al. 2012)
 - ▶ Contract enforcement
 - ▶ Human capital
- How much might be mechanical?
 - ▶ Show decomposition similar to BJRS

$$\ln P = \ln \# \text{Suppliers} + \ln \text{Ship/Supp} + \ln \text{VPS} - \ln Q$$

Role of trade policy uncertainty in sourcing styles

- Exploit reduction in uncertainty from Chinese accession to WTO
- Triple difference comparing imports
 - ▶ From China to those from the rest of World
 - ▶ In the pre-WTO period(1995-2001) to Post-WTO (2001-2007)
 - ▶ Of HS8 products with a lot water to those with a little

Reduction in trade policy uncertainty

Table 4: PNTR and procurement

Dependent Variable	Within		
	Importer- Exporter- Product	Within Importer- Product	Within Product
ln(Value per Shipment)	-0.07*** 0.01	-0.05*** 0.01	-0.17*** 0.05
ln(Quantity per Shipment)	-0.13*** 0.02	-0.04** 0.02	-0.04 0.10
ln(Price per Shipment)	0.04** 0.02	-0.04** 0.02	-0.11 0.09
ln(Weeks between Shipments)	-0.04 0.03	-0.06*** 0.02	-0.56*** 0.07
ln(Overall Relationship Length)	0.10*** 0.04	0.00 0.03	-0.54*** 0.08
Observations	752,600	1,011,700	324,300
Sample	<i>mzhep</i>	<i>mhcp</i>	<i>mcp</i>
Fixed Effects	<i>mz, c, p</i>	<i>mh, c, p</i>	<i>h, c, p</i>

- Results consistent with switching
- What about SPS in columns 2 and 3?

More definitive evidence on the mechanisms

- Evidence on whether switching occurs for existing relationships
- Do model predictions hold for imports that remain JS or AS?
 - ▶ JS: opposite effects
 - ▶ AS: no effects
- Evidence of a differential impact depending on complexity
 - ▶ Complexity affects inspection costs
 - ▶ Switching should increase in complexity

Tying this into the bigger picture

- Cool new paper delving into buyer-supplier relationships
- Key point: repeated interactions have future benefits
 - ▶ These benefits can lead to more efficient results today
 - ▶ Trade policy uncertainty diminishes value of future benefits
- Relational contracts important for ownership decisions
 - ▶ Kukharsky (JIE, 2016)
- How likely are trade wars?

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