Endogenous Trade Policy with Heterogeneous Firms

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Motivation

When choosing trade policies, politicians respond to pressures from special interest groups (Rodrik, 1995).

The workhorse model is the “Protection for Sale” model (Grossman and Helpman, 1994):

Organized sectors make political contributions to induce the government to deviate from the social welfare maximizing trade policy.

The model remains silent on

- intra-industry trade
- firm heterogeneity
- non-tariff barriers to trade
Contribution and main insights

In a lobbying model with heterogeneous firms and intra-industry trade, I study the endogenous determination of two types of non-tariff barriers to trade:

- **Behind-the-border measures** (e.g. technical standards)
  - raise the fixed costs of accessing the domestic market for both domestic and foreign producers (national treatment principle)
  - shift profits from the least to the most efficient domestic firms
  - reduce domestic social welfare
  - are nevertheless implemented in the political equilibrium if only the largest domestic firms lobby their government
  - increase in the efficiency of foreign exporters and decrease in the domestic government’s concern about social welfare
Border measures (e.g. customs procedures)

- raise the fixed costs of accessing the domestic market for foreign firms only
- lower competition from abroad
- increase the profits of all domestic firms
- reduce domestic social welfare
- are implemented either at their most deterring level (if the government’s concern for social welfare is low) or not at all
Model
Preferences and demand

- Two countries, Home and Foreign, populated by consumers with mass $L_H$ and $L_F$ with identical preferences

$$U = C_A + \mu \ln C_M \quad C_M = \left( \int c_i^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} \quad \sigma > 1$$

- Demand of the representative consumer for each variety is

$$c_i = \frac{\mu p_i^{-\sigma}}{P^{1-\sigma}}$$

where $P = \left( \int p_i^{1-\sigma} \, di \right)^{\frac{1}{1-\sigma}}$ is the ideal price index over all consumed varieties.
Production

- Labor as the only factor of production
- Numéraire $C_A$ produced with CRS under perfect competition and freely traded
- Differentiated good produced with IRS under monopolistic competition
- Home firm $i$ producing variety $i$ for the Home market incurs marginal costs $a_i$ and fixed costs $f_{HD}$
- Foreign firm $i$ exporting variety $i$ to the Home market incurs marginal costs $a_i$ and is subject to iceberg trade costs $\tau_H$ and fixed costs $f_{FE}$
- Profit maximization implies markup pricing
- The higher a firm’s marginal costs, the lower its variable profits
Firm heterogeneity

- Fixed mass of potential firms in Home and in Foreign (Chaney, 2008).
- Marginal productivities $\frac{1}{a}$ are Pareto distributed in Home and in Foreign.
- Least efficient firms cannot cover the fixed costs of market access and exit. This gives cutoff values $a_{HD}$, $a_{HE}$, $a_{FD}$, and $a_{FE}$.
- Remaining firms spend all of their profits on the numéraire.
- Social welfare in Home is composed of aggregate profits, aggregate labor income and consumer surplus,

$$W = \pi_{HD}^{agg} + \pi_{HE}^{agg} + L_H + L_H \left( \mu \ln \frac{\mu}{P_H} - \mu \right)$$
Trade policy instruments

**Behind-the-border measures** are regulations set by the Home government which increase the fixed costs of accessing the domestic market for both domestic and foreign producers, $f_{HD}$ and $f_{FE}$, by a factor $\alpha \in [1, \bar{\alpha}]$.

- force the least efficient Home and Foreign firms to exit
- reduce competition and raise the price index in Home
- shift profits to the most efficient Home and Foreign firms
- decrease social welfare in Home
Trade policy instruments

Behind-the-border measures

Figure: Effect of behind-the-border measures on the profits of Home firms
Trade policy instruments

Border measures are regulations set by the Home government which increase the fixed costs of accessing the domestic market for foreign exporters, $f_{FE}$, by a factor $\beta \in [1, \bar{\beta}]$.

- reduce foreign competition and raise the price index in Home
- raise the profits of all active Home firms
- induce less efficient Home firms to start producing for their domestic market
- decrease social welfare in Home
Trade policy instruments

Border measures

Figure: Effect of border measures on the profits of Home firms
The lobbying game

Menu auction based on Bernheim and Whinston (1986) and Grossman and Helpman (1994):

1. Home and Foreign firms draw marginal costs.
2. Home firms with \( a < a_L \) organize into lobby \( L \).
3. Lobby makes contributions \( C_L(\alpha) \) contingent on the policy \( \alpha \in [1, \bar{\alpha}] \) that is chosen, to maximize the joint welfare of its members net of contributions,

\[
G_L(\alpha) = W_L(\alpha) - C_L(\alpha) = \pi^L_{HD}(\alpha) + \pi^L_{HE} - C_L(\alpha).
\]

4. Home government chooses policy \( \alpha \in [1, \bar{\alpha}] \) to maximize

\[
G(\alpha) = \phi W(\alpha) + C_L(\alpha),
\]

and receives the corresponding contributions.

5. Firms which make positive profits produce, all other firms exit the Home market.
Equilibrium policies

In a truthful subgame-perfect Nash equilibrium the equilibrium policy \( \alpha^o \) must satisfy

\[
\alpha^o = \arg \max_{\alpha \in [1, \bar{\alpha}]} \left[ \phi W(\alpha) + W_L(\alpha) \right].
\]

Result
- if the weight on social welfare is sufficiently low, there exists a unique equilibrium level of \textit{behind-the-border measures} \( \alpha^o \) in the interior of \([1, \bar{\alpha}]\)
- \( \alpha^o \) is increasing in the efficiency of active foreign exporters and decreasing in the government’s weight on social welfare, \( \phi \)
Equilibrium policies

When firms lobby for **border measures** instead:

<table>
<thead>
<tr>
<th>Result</th>
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<tbody>
<tr>
<td>there exists no interior solution to $\beta^o$</td>
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<td>if the weight on social welfare is low, the equilibrium level of border measures will be the most deterring one, $\beta^o = \bar{\beta}$</td>
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<tr>
<td>if the weight on social welfare is high, the equilibrium policy is to implement no border measures at all, $\beta^o = 1$</td>
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Summary

Behind-the-border measures
- shift profits from the least to the most efficient domestic firms
- reduce domestic social welfare
- are nevertheless implemented in the political equilibrium if only the largest domestic firms lobby their government
- increase in the efficiency of foreign exporters and decrease in the domestic government’s concern about social welfare

Border measures
- lower competition from abroad
- increase the profits of all domestic firms
- reduce domestic social welfare
- are implemented either at their most deterring level (if the government’s concern for social welfare is low) or not at all
Extensions and areas for further research

- Welfare enhancing behind-the-border measures
- Endogenous lobby formation
- Interactions between national governments
- Robustness of the model
- Empirical implementation