Regulatory Protectionism, Multinational Corporations’ Preferences, and the Limits of International Cooperation

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Tariffs have declined, regulatory barriers persist

- **Average Applied Tariffs (DE, US, JP)**
- **Regulatory Barriers: TBT STCs**
Concentration of Cross-border Trade

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  a) \( \sim 2,000 \) firms do 80% of trade (1% of exporters)
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- ~2/3 of world trade involves multinational corporations.
  - In 1974, the revenue of the top 10 MNC combined to more than 0.4% of US GNP.
  - In 2012, the revenue of the top 10 MNC combined to more than 24% of US GNP
The Conventional Wisdom:

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- Deep international cooperation should follow from global production chains.
  
  Baldwin (2006); Lamy (2012).
My Argument

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  - As large exporters are organized multinationally, their host governments can benefit from non-tariff measures.
- International institutions which govern trade are ill suited for these problems.
Politics of Regulatory Protection

1. Puzzle: Lack of cooperation on regulatory protection
2. Theory: Why multinationals benefit from regulatory protection.
3. Empirical Results:
   1. Firm interests in regulatory protection
   2. Host Government adoption of regulatory barriers
4. Explaining the limits of the WTO
5. Conclusion
Case of non-tariff measures: Technical Barriers

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- TBTs offer an appropriate case of regulatory protection:
  - TBT specify a specific variety and can be classified into the same schedules as tariffs.
  - TBT are used on products whose tariffs have been low the longest.
  - TBT offer a number of non-protectionist alternative explanations, environmental concerns, consumer safety, quality assurance etc.
My paper focuses on three hypotheses

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- **H2**: Host governments are likely to adopt regulatory protection to advantage local MNC.
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- **H2**: Host governments are likely to adopt regulatory protection to advantage local MNC.
- **H3**: Multilateral negotiations are more difficult in the face of regulatory protection.
Strategy for this talk

- Firm interests (H1):
  - Formal analysis of exporting firm interests
  - American chemical firm preferences and outcomes under European Regulation using 160,000 chemical patents.
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  - Empirical proxies for multinational activity.
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■ International Cooperation (H3):
  ■ Analysis of reciprocity as enforcement of cooperation in GATT/WTO.
  ■ Trade policymaking from the Uruguay Round tariff negotiations.
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Why do Regulatory Barriers benefit leading firms?

- Regulatory barriers directly harm profits, but also affect competition.
- Regulatory barriers can deter entry, raising prices (Rogerson (1986)).
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- An illustration: Oligopolistic Competition.
  - Firm level differences in productivity, facing a regulatory barrier.
  - Cournot competition with endogenous entry.
Profits of low cost firms facing regulatory protection.
Solution Concept: Cournot Nash Equilibrium

- All firms simultaneously choose entry or exit and the amount to produce in response to all other producers.
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- In equilibrium, each firm conjectures correctly, and all firms choose their best response, entering and producing: $q_H^*, q_L^*, N^*$.
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- All firms simultaneously choose entry or exit and the amount to produce in response to all other producers.
- In equilibrium, each firm conjectures correctly, and all firms choose their best response, entering and producing: $q_H^*, q_L^*, N^*$.
- The low cost firm is larger $q_H^* < q_L^*$ and will generally receive positive profits.
Zero Profit Condition generates $N^*$

- Firms enter if they earn profit from doing so.
Zero Profit Condition generates $N^*$

- Firms enter if they earn profit from doing so.
- In equilibrium, the number of high cost firms in the market (N) is determined by a Zero Profit Condition.
- $N^*$ is a decreasing (stepwise) function of the regulatory barrier.
Entry under varying Regulatory Barriers

Number of Entrants

Regulatory Barriers
Regulatory Barrier vs. Number of Entrants/Profits of Low Cost Firm

- R1
- R2
- R3
Regulatory Barriers in Oligopolistic Competition

When firms vary in marginal cost, regulatory barriers have competitive benefits for some firms.

1. Regulatory barriers drive out entrants.
2. All surviving firms increase production, → higher sales for every surviving firm.*
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$\Rightarrow$ (1) is more important for quantity than (2), $\rightarrow$ lower net quantities and higher prices.
Regulatory Barriers in Oligopolistic Competition

- When firms vary in marginal cost, regulatory barriers have competitive benefits for some firms.
  1. Regulatory barriers drive out entrants.
  2. All surviving firms increase production, → higher sales for every surviving firm.*
  ⇒ (1) is more important for quantity than (2), → lower net quantities and higher prices.

- Higher prices and higher production lead to higher profits for the low cost firm.
Regulatory Barriers do not always lower trade volume
Implications of formal analysis

- Raising costly regulatory barriers in the destination market benefits the lowest cost exporters.
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⇒ *Productive firms join the protectionist coalition in the destination market.*
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- These distortions are potentially orthogonal to overall trade activity.
Implications of formal analysis

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  ⇒ *Productive firms join the protectionist coalition in the destination market.*

- These distortions are potentially orthogonal to overall trade activity.
  ⇒ *The current emphasis on trade volume in scholarship and practice is insufficient for regulatory protection.*
Application to contemporary trade context

- Assuming differences in marginal cost, the lowest costs firms export and to organize as Multinational Corporations (MNCs).
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Application to contemporary trade context

- Assuming differences in marginal cost, the lowest costs firms export and to organize as Multinational Corporations (MNCs).

  ⇒ *MNCs join the protectionist coalition.*

- The model confirms the conventional wisdom for tariffs: MNCs are hurt by higher marginal costs.

  ∴ **H1**: Regulatory barriers, unlike tariffs, can benefit low cost firms, especially MNCs.
“... REACH often works to the advantage of large companies who have the resources to establish and run compliance programs. Smaller companies must often go outside and pay for the resources to comply. **Ironically, REACH has succeeded in doing what the anti-trust laws were designed to prevent — giving a competitive advantage to large companies.**” - Senior lobbyist of a large chemical firm.
Summary of case study of regulatory protection

- Consistent with **H1**, changes in the EU chemical sector benefited the low cost, US MNCs, at the expense of smaller, more marginal exporters.

  ➞ Findings are also consistent with French firm response to SPS (Fontagné, Orefice, Piermartini and Rocha (2012)).
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- The conventional political coalitions are reversed, marginal exporters favor of regulatory liberalization.

- Large, low cost firms are aware of, and act on their competitive interest in foreign regulations.
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I offer an explanation: Regulatory barriers promote local multinational corporation profits.
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\[ \textbf{H2}: \text{Host governments will be more likely to adopt regulatory barriers to trade in sectors with more multinational activity.} \]
Evidence for Government Adoption of Regulatory Barriers

- Data: Specific Trade Concerns regarding Technical Barriers to Trade.
- Examine whether those sectors associated with MNC activity in the host state are more likely to elicit complaints at the WTO.
Contract Intensity as a proxy for multinationals

- Low cost firms organize as multinational corporations if there is an ownership advantage.
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- Ownership alleviates contractual problems across the supply chain.
- Industries that are more contract intensive will require organization as a multinational corporation.
- Contract Intensity $\in [0, 1]$ measures the extent of relationship-specific investments in production. Each product is coded as being sold on an exchange, reference priced, or neither (Rauch 1999).
## Contract Intensity as a measure of globalized production

<table>
<thead>
<tr>
<th>Contract Intensity</th>
<th>Low</th>
<th>High</th>
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<tbody>
<tr>
<td></td>
<td>0.024</td>
<td>0.980</td>
</tr>
<tr>
<td>Poultry processing</td>
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<td>Automobile manuf.</td>
</tr>
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<td>Flour milling</td>
<td>0.036</td>
<td>Heavy-duty truck manuf.</td>
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<td>Computers</td>
</tr>
<tr>
<td>Wet corn milling</td>
<td>0.053</td>
<td>Audio &amp; Video equipment.</td>
</tr>
<tr>
<td>Aluminum manuf.</td>
<td>0.904</td>
<td>Computer peripherals</td>
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from Rauch measure, reported in Nunn (2007)

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<td>Upstream</td>
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<tr>
<td>4.651 Petrochemicals</td>
</tr>
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<td>4.355 Copper smelting</td>
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<td>4.064 Aluminum smelting</td>
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<td>3.853 Organic chemicals</td>
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from 2002 IO tables Antràs, Chor, Fally, and Hillberry (2012)
Data on Technical Barriers to Trade

- Contract Intensity: from Rauch (1999)
- Royalty Receipts: Balance of Payments proxy for local share of multinational profits (IMF).
- DV: Technical barriers to trade (TBT) \( \in \{0, 1\} \) submitted to WTO Committee on Technical Barriers to Trade and classified at the HS 4 level.
## Theoretical expectations

### Predictions for adoption of Technical Barriers to trade

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Effect of Contract Intensity conditional on Headquarter Activity

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2 sample difference of proportions test: $\chi^2_{df=1} = 1702$
Host governments enact Technical Barriers in globalized industries

- TBT adoption consistent with **H2**: Governments use regulatory barriers in sectors with some retention of multinational profits.
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- Results are robust to industry and country fixed effects, as well as correcting for rare events.
- Regulatory protection is a consequence of collusion between \textit{host} governments and multinational corporations: International regulatory capture.
Host governments enact Technical Barriers in globalized industries

- TBT adoption consistent with H2: Governments use regulatory barriers in sectors with some retention of multinational profits.
- Results are robust to industry and country fixed effects, as well as correcting for rare events.
- Regulatory protection is a consequence of collusion between host governments and multinational corporations: International regulatory capture.
- Marginal exporters, consumers and home governments lose from this regulatory capture.
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Multilateral Trade Rules

Havana 1947

Geneva 2012
GATT/WTO rules cover market access

- **Non-discrimination**
  - *Article III National Treatment*: regulations should not be applied so as to afford protection to domestic production.

- **Reciprocity**
  - *Article XXVIII Nullification or Impairment*: if benefits of the GATT are nullified or impaired, members may be authorized to withdraw concessions.


- These two rules limit the use of regulatory protection as a substitute for tariffs, appear to be insufficient today.
Enforcement and Regulatory Barriers in the WTO

- In the GATT/WTO, enforcement of obligations is measured by the level of “Market Access.”
- At the WTO, market access is generally measured as overall trade volume.\(^1\)
- **If regulatory barriers don’t reduce trade volume, governments lack grounds for remuneration (Article XXVIII).**

\(^1\)Trade volume is an aggregate trade value measure adjusted for inflation and exchange rate movements.
Reciprocity Rules during the Uruguay Round

To what extent are WTO negotiations frustrated by the lack of enforcement?
Reciprocity Rules during the Uruguay Round

- To what extent are WTO negotiations frustrated by the lack of enforcement?
- I examine US tariff concessions by product in sectors across levels of multinational organization and existing regulatory barriers.
Reciprocity Rules during the Uruguay Round

- To what extent are WTO negotiations frustrated by the lack of enforcement?
- I examine US tariff concessions by product in sectors across levels of multinational organization and existing regulatory barriers.
- I show that reciprocal reductions in tariffs are lowest in those sectors with multinational activity, reversing the conventional wisdom.
Data

- Dependent variable: 5386 US tariff lines, ad valorem bound rate.
- Average tariff concessions by each of the top 5 foreign exporters of each product.
- Proxies for effective enforcement (threat to enact reciprocity).
  - Regulatory Protection: NTM measure from TRAINS dataset.
  - Proxy for Multinational Activity: Contract Intensity from Rauch.
\[ \Delta \tau_{i,US} = \Delta \text{Tariff Concessions}_i + NTM_i + \Delta \text{Tariff Concessions}_i \times NTM_i + \ldots \]

- \[ \Delta \text{Tariff Concessions}_i = \sum_k s_i^k \left( \sum_j \Delta \tau_j^k w_j^k \right) \]
  - \[ -\Delta \tau_j^k \] is the percentage tariff reduction by country k on good j.
  - \[ w_j^k \] is the share of good j in all of country k’s imports.
  - \[ s_i^k \] is the share of exports of good i from country k sent to the US.

→ Sectors with NTMs should suffer from a lack of institutional mechanisms to enforce obligations.
Reciprocity is negative in Contract Intense products

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International Cooperation was undermined by lack of enforcement

- The rules of the international system are ill-suited to address intra-industry competition.
  - The US has an incentive to engage in regulatory protection to shift imports toward local multinationals.
  - US partners responded by refusing to grant reciprocal concessions in tariffs.

- This is because the rules that enforce these agreements are least efficacious for the most globalized products.

- This bodes poorly for the GATT/WTO as production continues to become more globalized.
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Summary of Findings

- While opposed to tariffs, the largest and most productive firms can benefit from regulatory protection.
- Protectionist host governments can serve these firms by enacting regulatory barriers.
- The rules and concepts of the multilateral system are ill equipped to handle these challenges.
Broader Implications

- Market participation does not necessarily imply an interest in market openness.
- Complementarity between host government regulatory autonomy and the competitive interests of MNCs.
- Regulatory liberalization is likely to require new instruments beyond the WTO.
Thank you.
Broader Book Project

Chapter 1  The Role of Global Supply Chains in International Trade.
Chapter 2  The Governance of Trade and Investment.
Chapter 3  Regulatory protectionism, MNC profits, and the limits of international cooperation.
Chapter 4  Global Production Diversion and the Depth of Trade Agreements.
Chapter 5  Optimal Delegation in Multilateral Standards Agreements.

Appendix
Take away points

- Reexamined the interests that underly liberalization:
  - Multinationals can benefit from the indirect consequences of regulatory protection.
  - Host governments may have collusive interests with these firms, their interest are not represented by trade volume.

- Reexamining international cooperation:
  - The trade regime may work for tariffs, but these aren’t the challenges today.
  - Rather than being evidence for the generality of reciprocity and cooperation, the GATT/WTO trade regime may be a special case.
# US Tariff Concessions during Uruguay Round

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<tr>
<td>Tariff Concessions</td>
<td>-0.001</td>
<td>0.018*</td>
<td>0.037*</td>
<td>0.052*</td>
<td>0.034*</td>
</tr>
<tr>
<td></td>
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<td>(0.006)</td>
<td>(0.015)</td>
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<td>(0.013)</td>
</tr>
<tr>
<td>NTM</td>
<td>-0.571</td>
<td>-3.246*</td>
<td>-</td>
<td>-2.487*</td>
<td>-0.404</td>
</tr>
<tr>
<td></td>
<td>(0.405)</td>
<td>(0.526)</td>
<td>-</td>
<td>(0.656)</td>
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<tr>
<td>NTM X Concessions</td>
<td>-0.001</td>
<td>-0.054*</td>
<td>-</td>
<td>-0.046*</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.01)</td>
<td>-</td>
<td>(0.013)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Contract Intense</td>
<td>-</td>
<td>-</td>
<td>-3.861*</td>
<td>-3.924*</td>
<td>-3.727*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1.697)</td>
<td>(1.701)</td>
<td>(1.365)</td>
</tr>
<tr>
<td>Contract X Concessions</td>
<td>-</td>
<td>-</td>
<td>-0.084*</td>
<td>-0.086*</td>
<td>-0.081*</td>
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<td></td>
<td></td>
<td></td>
<td>(0.032)</td>
<td>(0.032)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>PTA</td>
<td>1.127*</td>
<td>1.167*</td>
<td>0.952*</td>
<td>0.967*</td>
<td>0.949*</td>
</tr>
<tr>
<td></td>
<td>(0.14)</td>
<td>(0.141)</td>
<td>(0.163)</td>
<td>(0.164)</td>
<td>(0.164)</td>
</tr>
<tr>
<td>Bargaining Power</td>
<td>0.009*</td>
<td>0.01*</td>
<td>0.007*</td>
<td>0.008*</td>
<td>0.007*</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>I(Multi HS8)</td>
<td>-0.81*</td>
<td>-0.848*</td>
<td>-0.741*</td>
<td>-0.778*</td>
<td>-0.758*</td>
</tr>
<tr>
<td></td>
<td>(0.205)</td>
<td>(0.206)</td>
<td>(0.246)</td>
<td>(0.247)</td>
<td>(0.246)</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>-3.498*</td>
<td>-2.516*</td>
<td>-1.812*</td>
<td>-0.991</td>
<td>-1.966*</td>
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<td>(0.347)</td>
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<td>(0.731)</td>
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<tr>
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<td>5386</td>
<td>5386</td>
<td>3890</td>
<td>3890</td>
<td>3890</td>
</tr>
</tbody>
</table>

\* \( p \leq 0.05 \)  

Data from Limão (2006), Nunn (2007), WTO (2012)
Was there a U-turn?

- In pre-announcement lobbying, presumption was that the chemical industry was trying to derail REACH.

- “BASF welcomed REACH already in 2006 when it was adopted and has not changed its position on REACH since then. \textit{it is misleading to speak of a ’U turn’ in our communication on REACH},” - senior manager at BASF.\(^2\)

- Note the absence of a claim prior to announcement.

- Why would early lobbying be so heavy?

\(^2\)EurActiv 2011
Lobbying on REACH prior to announcement

- I read leading firm lobbying statements and found several points of contention.
Lobbying on REACH prior to announcement

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  - Large firms oppose requirements to *re-register* some existing products because of their inputs.
  + Large firms instead propose that "each manufacturer in the chain should have the responsibility."
Lobbying on REACH prior to announcement

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  - Large firms oppose requirements to *re-register* some existing products because of their inputs.
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  - Large firms oppose *bans* on some ‘high concern’ products because of their inputs.
  - Large firms instead propose a 2% threshold of hazardous inputs before a ban.
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  - Large firms oppose *bans* on some ‘high concern’ products because of their inputs.
  + Large firms instead propose a 2% threshold of hazardous inputs before a ban.
  - The maximum fine of 10% of the annual world-wide turnover was taken from EU competition law.
  + “Fines should be capped at fixed amounts (for example at €100,000 or less per offence).” - Dow.
Changes to REACH prior to 2006

- Fines went unspecified.
- Rather than banning substances of ‘high concern’ the final legislation only required a proposal to search for substitutes (Vogel 2012)
- An overall adoption of the ‘precautionary principle’, or a low threshold for regulatory intervention.
If trade volume can go up, why do governments complain about these measures?
Welfare

- If trade volume can go up, why do governments complain about these measures?
- Marginal exporters are forced to exit. 98% of exporters are small businesses, with voice.
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- Regulatory barriers may advantage main targets, but have externalities on third countries.
If trade volume can go up, why do governments complain about these measures?

- Marginal exporters are forced to exit. 98% of exporters are small businesses, with voice.
- Regulatory barriers may advantage main targets, but have externalities on third countries.
- Home governments do not internalize all profits of home MNCs, motivating host governments.
Profits of leader facing regulatory protection.
Diagram of Leader/Fringe Model

Leader

\[ p(Q) = \alpha - (q_l + q_e) \]

Entrant

Enter

\[ p(Q) = \alpha - (q_l + q_e) \]

Exit

\[ p(Q) = \alpha - q_l \]
Regulatory Barriers with sequential entry

- One leader (l) with a competitive fringe (e), competing via quantity \( q \).
- All firms have the \textit{same} cost function, with variable \( c \) and fixed cost regulatory barrier \( F \):
  \[ C(q_i) = c \cdot q_i + F \]
- Aggregate demand is a decreasing function of the total quantity produced \( Q = \sum q_i \).
  \[ p(Q) = \alpha - Q \]
Regulatory Barriers with sequential entry

- One leader ($l$) with a competitive fringe ($e$), competing via quantity $q$.
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- Aggregate demand is a decreasing function of the total quantity produced $Q = \sum_i q_i$.
  
  $$ p(Q) = \alpha - Q $$

- Firm profits depend on endogenous price $p(Q)$ and the choice of quantity $q_i$.
  
  $$ \pi_i = p(Q) \times q_i - C(q_i) $$
What quantity \((q_l)\) would deter entry?

A fringe entrant will choose its quantity \((q_e)\) taking the leader’s quantity \((q_l)\) as given to maximize profits \(\pi_e(q_e, q_l)\).
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\[
q_e^* = \frac{\alpha - c}{2} - \frac{q_l}{2}
\]
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\[
q_e^* = \frac{\alpha - c}{2} - \frac{q_l}{2}
\]

At the first stage, the leader will remove the incentive to enter \(\pi_e(q_e^*) = 0\):

\[
q_l^* = (\alpha - c) - \sqrt{4F}
\]

\[
q_e^* = 0
\]
Consider the profits of the leading firm $\pi_l(q^*_l, q^*_e = 0)$

$$\pi_l = \sqrt{4F} \times (\alpha - c) - 5F$$
Regulatory Barriers and the profits of the leading firm

- Consider the profits of the leading firm $\pi_l(q_i^*, q_e^* = 0)$

- Direct effect of $F$

  \[ \pi_l = \sqrt{4F} \star (\alpha - c) - 5F \]
Regulatory Barriers and the profits of the leading firm

- Consider the profits of the leading firm $\pi_l(q^*_l, q^*_e = 0)$
- Direct effect of $F$
  \[
  \pi_l = \sqrt{4F} \cdot (\alpha - c) - 5F
  \]
- Indirect effects of $F$
Consider the profits of the leading firm $\pi_i(q_i^*, q_e^* = 0)$

Direct effect of $F$

$$\pi_i = \sqrt{4F} \ast (\alpha - c) - 5F$$

Indirect effects of $F$

Leader profits can be an *increasing* function of the regulatory barrier:

$$\frac{d\pi_i}{dF} > 0 \iff F < \frac{(a - c)^2}{25}$$
Leader Profits, $a=5$, $c=1$
In general, regulatory barriers affect competition by deterring entry.

The sequential entry model assumes that the first mover can credibly commit to painful punishments off the equilibrium path (limit price *upon entry*).
Robustness of Leader/Fringe Model

- In general, regulatory barriers affect competition by deterring entry.
- The sequential entry model assumes that the first mover can credibly commit to painful punishments off the equilibrium path (limit price *upon entry*).
- In the Melitz (2003) framework, firms differ in marginal cost (productivity) and enter simultaneously.
Identification Strategy

- Reciprocity implies that some cuts in tariffs by US respond to choices by the United States.
- To deal with endogeneity, total partner tariff reductions are instrumented using unilateral [non-reciprocal] tariff reductions during the stalled negotiations between 1986 and 1992 (Limão (2006)).
- This strategy assumes that unilateral concessions are exogenous to the eventual offers by the United States toward the latter part of the negotiations.

\[ \Delta \tau_j^k = \Delta \tau_{\text{unilateral}} + N T M_{\text{unilateral}} + \ldots \]
Simplification of Profits Under Linear Demand

\[ \pi_H(q_H^*, N) = q_H^*(\alpha - c_H - N \cdot q_H^* - q_L^*) - F \]

\[ = q_H^* \left( \alpha - c_H - N \cdot q_H^* - \left( \frac{\alpha - c_L - N \cdot q_H^*}{2} \right) \right) - F \]

\[ = q_H^* \left( \frac{\alpha + c_L - 2c_H}{2} - \frac{N \cdot q_H^*}{2} \right) - F \]

\[ = q_H^* \left( q_H^* \cdot \frac{N + 2}{2} - \frac{N \cdot q_H^*}{2} \right) - F \]

\[ = q_H^* \cdot q_H^* - F \]
Alternative explanations: Firm Interests

- Firms may patent to avoid regulation.
Alternative explanations: Firm Interests

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  → Porter Hypothesis: Regulations produce innovation/patent activity
**Alternative explanations: Firm Interests**

- Firms may patent to avoid regulation.
- **Porter Hypothesis**: Regulations produce innovation/patent activity
- Patent patterns may reflect broader trends in EU.
Aggregate Activity

Total Patents in EPO

Total American Chemical Patents
Aggregate Activity

Patents before and after REACH

Zoomed in.

→ Appendix
Alternative explanations: Government Choices

- Regulatory demand may drive observed correlation between TBT and having both high royalty receipts and contract intense products.
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- Regulatory demand may drive observed correlation between TBT and having both high royalty receipts and contract intense products.
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  - No particular reason to think regulatory demand has changed in main TBT users.
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  - No particular reason to think regulatory demand has changed in main TBT users.

- Specific Trade Concerns suffer from selection effects.
  - Foreign Governments may choose to complain when they feel they can succeed at low cost.
  - Foreign Governments may choose to complain when stakes are high.
Appendix

- Rogerson (1986)
- Welfare
- Pre-Implementation REACH
- Patent Data
- TBT Data
- Plot of Low Cost Profits
- Book Project
- Conclusion