Enforcement, Private Political Pressure and the GATT/WTO Escape Clause

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1 Introduction

1.1 Features of International Negotiations

- Negotiation under uncertainty
- Implementation with private information
- Self-enforcement constraints for implementation

1.2 Two Characteristics of GATT/WTO

- Negotiation of upper bounds
  applied tariffs often below bounds
- Escape Clauses (EC)
  GATT Article XIX, WTO Safeguard Agt.

1.3 Broad Points

- Positive: 3 features $\Rightarrow$ 2 characteristics
- Normative: Explore EC rules that facilitate greater efficiency when Govt’s have private information.

1.4 Model

- Two-good, two-country
- Repeated tariff game
- Private political shocks in import-comp. sectors (iid)
1.5 Results

- Strong versus Weak Bindings
  
  Govt’s prefer weak bindings
  Optimal weak tariff binding is higher
  Applied tariffs thus more often below bound

- Self-Enforcement and Weak Bindings
  
  Patient $\Rightarrow$ can enforce optimal weak binding
  Less Patient $\Rightarrow$ can enforce higher weak binding
  Impatient $\Rightarrow$ may end up at Nash

- Escape Clauses (2 bindings) and Patient Govt’s
  
  Weak Bindings $\Rightarrow$ No value to EC
    1. Incentive Compatibility Problem
    2. Negative Result. Instructive

  Strong EC binding $\Rightarrow$ Can help if EC tariff high
    1. Proposed change?
    2. Commitment Interpretation

  Weak Bindings & Sidepayments $\Rightarrow$ Valuable
    1. Proposed change?
    2. Compensation/Retaliation Interpretation

  Dynamic Use Constraint $\Rightarrow$ Valuable
    1. Idea: Use EC today $\Rightarrow$ Can’t tomorrow
    2. WTO Safeguard Agreement
1.6 Related Literature

- Trade
  Sykes (1991)
  Bagwell-Staiger (1990, 2003)
  Rosendorff-Milner (2001)
  Feenstra-Lewis (1991)
  Martin-Vergote (2004)

- Industrial Organization/Game Theory
  Athey and Bagwell (2001)
  Athey, Bagwell and Sanchirico (2004)
2 The Model

2.1 Basic Setup

- Two countries: Home and Foreign (*)

- Two goods: x and y

- Each good produced and demanded in each country

- Home imports x, and foreign imports y

- Symmetric countries, goods

- Linear demands, supplies

- Political pressure, $\gamma$ ($\gamma^*$), determines Home (Foreign) welfare weight on profit in import comp. sector x (y)

- $\gamma$ and $\gamma^*$ are iid over $[\underline{\gamma}, \bar{\gamma}]$ with dbn function $H$, where $\underline{\gamma} = 1$ (national income) and $\bar{\gamma} < 7/4$ (positive trade volume)

- Import tariffs are only trade-policy instruments
• Import tariffs, $\tau$ and $\tau^*$, determine market-clearing world (export) and local (consumption) prices:

• Home welfare functions

$$W_x = \int_{\tilde{P}_x}^{1} D(P_x) dP_x + \pi_x(\tilde{P}_x) + [\tilde{P}_x - P^w_x] M_x(\tilde{P}_x)$$

$$W_y = \int_{\tilde{P}_y}^{1} D(P_y) dP_y + \pi_y(\tilde{P}_y)$$

• Foreign welfare functions: symmetric

• Partial Equilibrium: $\tau$ affects only $w_x$ and $w_x^*$

• Nash Home tariff: Max $W_x \Rightarrow \tau^N(\gamma)$

• Efficient Home tariff: Max $W_x + W_x^* \Rightarrow \tau^E(\gamma)$

• Comparison: $\tau^N(\gamma) > \tau^E(\gamma)$

• Terms-of-trade inefficiency, Prisoners’ Dilemma
Figure 1
2.2 Incentive Compatibility

- Consider static game

- Home gov’t privately observes $\gamma$

- Suppose govt’s wish to apply tariffs according to some schedule $\tau(\gamma)$

- Incentive Compatibility (Truth-telling constraint):
  $\tau(\gamma)$ must be designed so that a gov’t of type $\gamma$ would rather choose $\tau = \tau(\gamma)$ than any other $\tau' = \tau(\gamma')$

- Our setting: An applied tariff schedule is IC only if it is non-decreasing in $\gamma$

- Nash tariff schedule is IC.

- Single tariff is IC.

- Efficient tariff schedule is not IC.
3 Rigid Tariffs

- Static Model

- Negotiate binding under uncertainty (before observing type)

- Rigid Tariffs = One binding (no EC)

- Strong Binding = Must apply the binding

- Weak Binding = Must apply a tariff no higher than the binding

- Set binding to maximize expected joint welfare (i.e., $E[W_x + W_z]$).

3.1 Strong Bindings

- Set rigid binding, $\tau^R$.

- Optimal rigid strong binding: $\tau^*_s = \tau^E(E\gamma)$

- Assume $E\gamma > 5/4$ so that $\tau^*_s > \tau^N(\gamma)$
3.2 Weak Bindings

- Set weak binding $\tau^R$

- After observing $\gamma$, Home applies $\tau = \min(\tau^N(\gamma), \tau^R)$

- Define $\gamma^N(\tau^R)$ by $\tau^N(\gamma) = \tau^R$

- Types below $\gamma^N(\tau^R)$ apply their optimal (Nash) tariffs, and types above $\gamma^N(\tau^R)$ apply the binding, $\tau^R$.

- Define $E(\gamma \mid \tau^R)$ as the expected type, conditional on being bound (i.e., conditional on $\gamma \geq \gamma^N(\tau^R)$).

- Optimal rigid weak binding: $\tau^R_{\text{w}} = \tau^E(E(\gamma \mid \tau^R))$

- Implicit equation. Solution exists (appendix)

Prop. 1: Govt’s prefer negotiating weak rather than strong bindings. When they negotiate weak bindings, the optimal binding (i) is higher than under strong bindings, and (ii) induces applied tariffs strictly below the bound level for govt’s with low realizations of political pressures.
4 Enforcement

- GATT/WTO agreements must be self-enforcing

- Repeated Prisoners’ Dilemma with Private Info

- Repeated Game, iid draws

- Perfect Public Equilibria

- Focus on Symmetric Equilibria

- Sometimes: Stationary Equilibria

- On-Schedule Deviations (like IC)

- Off-Schedule Deviations (punish with Nash)
4.1 Patient Governments

- Goal: Find the critical patience above which Govt’s can maintain the applied tariffs induced by the optimal weak binding, $\tau^R_w$.

- On-schedule IC satisfied. Check off-schedule.

- Short term incentive to cheat: For $\gamma \geq \gamma^N(\tau^R)$,

$$\Omega(\tau^R; \gamma) \equiv W_x(\tau^N(\gamma); \gamma) - W_x(\tau^R; \gamma)$$

Largest for highest type, $\tau$.

- Future cost of breakdown:

$$\frac{\delta}{1-\delta} \omega(\tau^R)$$

where

$$\omega(\tau^R) \equiv E[W_x(\tau^R; \gamma) + W^*_x(\tau^R | \tau^R) - EW^N]$$

- The applied tariffs induced by a weak binding at $\tau^R$ do not invite an off-schedule deviation iff

$$\Omega(\tau^R; \tau) \leq \frac{\delta}{1-\delta} \omega(\tau^R).$$
Figures 3 and 4
Definitions

- The applied tariffs “induced” by a weak tariff binding $\tau^R$ are defined by the function $\tau(\gamma)$ such that $\tau(\gamma) = \tau^N(\gamma)$ for $\gamma \leq \gamma^N(\tau^R)$ and $\tau(\gamma) = \tau^R$ for $\gamma \geq \gamma^N(\tau^R)$.

- For a given $\delta \in (0, 1)$, a weak tariff binding $\tau^R$ is an “equilibrium binding” if a stationary equilibrium exists for the repeated game in which in each period Govt’s select the applied tariffs induced by $\tau^R$.

- For a given $\delta \in (0, 1)$, an equilibrium binding $\tau^R$ is an “optimal equilibrium binding” if no other equilibrium binding exists that yields higher expected welfare.

Prop. 2: There exists $\delta^R \in (0, 1)$ such that, for all $\delta \geq \delta^R$, $\tau^R$ is the optimal equilibrium binding.

- Patient Govt’s can enforce the optimal weak binding

Prop. 3: There exists $\delta \in (0, \delta^R)$ such that, for all $\delta \in [\delta, \delta^R)$, the optimal equilibrium binding is characterized by $\tau^R(\delta)$ where $\tau^N(\gamma) > \tau^R(\delta) > \tau^R_w$ and $\partial \tau^R(\delta)/\partial \delta < 0$.

- Slightly less patient Govt’s do best by enforcing the tariffs induced by a slightly higher bound tariff.
Figure 5
5 The Purpose and Design of the Escape Clause

- Negotiate 2 bindings: Normal and exceptional times.
- Goal: Better match tariffs with political pressures

5.1 Escape Clause with Weak Bindings

- Look for a two-step binding system, with two bindings, $\tau_1^R$ and $\tau_2^R$, and a breakpoint type, $\gamma_b$.
- IC implies applied tariff non-decreasing

Prop. 4: A system of two-step rigid tariffs cannot offer any improvement over a system with one rigid tariff, when bindings are weak.

- Idea: Tariff above highest binding is off-schedule deviation. Highest binding does all the work.
- Private information and weak bindings are key for this result.
Figure 6
Figure 6
5.2 Escape Clauses with Strong Bindings

- Normal tariff binding, $\tau^R_1$, is a weak binding, and EC tariff binding, $\tau^R_2$, is a strong binding.

- Can support applied tariffs in Figure 6. Applied tariff b/t the bounds is now an off-schedule deviation.

- High tariff is costly (above optimal!), and only attractive to higher types. On-schedule IC is satisfied.

- Might be enforceable even if the optimal weak binding is not:
  - $\omega$: reduced for higher types
  - $\omega$: not significantly changed if higher types are rare.

- Interpretations:
  - Introduce strong EC bindings?
  - Credible discretion with commitment effects.

- Cost is borne also by trading partner. Inefficient way to achieve some sorting?
5.3 Escape Clause with Side Payments

- Idea: Make side payment if use EC binding. Can implement efficient tariffs, if choose transfer schedule appropriately.

- Quasi-linear setting: no efficiency cost to transfers.

- Extreme case: Continuum of EC alternatives. $T(\gamma)$ is the transfer paid by Home Gov’t to Foreign Gov’t if Home applies $\tau(\gamma)$.

- On-schedule IC holds only if $\tau(\gamma)$ non-decreasing. Recall $\tau^E(\gamma)$ is non-decreasing.

- On-Schedule IC: Derive $T^E(\gamma)$ that implements $\tau^E(\gamma)$:

$$W_x(\tau^E(\gamma); \gamma) - T^E(\gamma) = W_x(\tau^E(\gamma); \gamma) - T^E(\gamma) + \int_\gamma^\gamma \frac{\partial W_x(\tau^E(\gamma); \gamma)}{\partial \gamma} d\gamma$$

$T^E(\gamma)$ is strictly increasing.

- Enforcement: Off-Schedule Constraint most easily satisfied if set $T^E(\gamma) = 0$ (to minimize $\Omega$).
Prop. 5: There exists $\delta^E \in (0,1)$ such that for all $\delta \in [\delta^E, 1]$, the efficient tariffs, $\tau^E(\gamma)$, can be implemented in a stationary equilibrium of the modified repeated game, where in each period along the equilibrium path the Govt’s adopt the tariff-transfer scheme $\{\tau^E(\gamma), T^E(\gamma)\}$ with $T^E(\gamma) = 0$.

Literal Interpretation

- May be valuable to include transfers as part of EC.
- Tension with WTO elimination of VERs and associated transfer of “quota rents” from importing to exporting country.

Suggestive Interpretation

- Think of GATT/WTO compensation & retaliation provisions as playing role analogous to side payments.
- Tension with WTO elimination of compensation & retaliation provisions in EC actions.
5.4 EC with Dynamic Use Constraint

- Motivation: WTO Safeguard Agt.

- Dynamic Use Constraint $\Rightarrow$ opportunity cost. May make EC incentive compatible.

- Two-state dynamic binding system: two tariff bindings, $\underline{\tau}$ and $\tau$, such that
  \[ \tau^N(\tau) \geq \tau > \underline{\tau} \geq \tau^N(\underline{\tau}). \]

- First state: Occurs if, in the previous period, the Gov’t applied a tariff $\tau$ such that $\tau \leq \underline{\tau}$. The Gov’t then elected to bind at $\underline{\tau}$ in the previous period.

- Second state: Occurs if, in the previous period, the Gov’t applied a tariff $\tau$ such that $\tau > \underline{\tau}$ and $\tau \leq \tau$. The Gov’t then elected to bind at $\tau$ in the previous period.

- First State has flexibility in the current period: Gov’t can choose whether to bind at $\underline{\tau}$ (maintain the state) or $\tau$.

- Second State has no flexibility in the current period: Gov’t must bind at $\underline{\tau}$ (change the state).

- Focus for comparison: $\underline{\tau} = \tau^L$ and $\tau = \tau^R + \varepsilon$.

- Breakpoint type, $\gamma^*$, is indifferent b/t binding at $\underline{\tau}$ and $\tau$, when in first state. Requires $\gamma^* > \gamma^N(\underline{\tau})$. 

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Figure 7
Figure 7
• Induced tariffs in state 1:
  if $\gamma \leq \gamma^*$, Gov’t binds at $\tau$ and thus applies:
  1. $\tau^N(\gamma)$ if $\gamma \in [\overline{\gamma}, \gamma^N(\overline{\tau})]$
  2. $\overline{\tau}$ if $\gamma \in [\gamma^N(\overline{\tau}), \gamma^*]$.
  if $\gamma > \gamma^*$, Gov’t binds at $\tau$ and thus applies $\tau$.

• Induced tariffs in state 2:
  Gov’t must bind at $\overline{\tau}$ and thus applies:
  1. $\tau^N(\gamma)$ if $\gamma \in [\overline{\gamma}, \gamma^N(\overline{\tau})]$
  2. $\overline{\tau}$ if $\gamma \in [\gamma^N(\overline{\tau}), \overline{\gamma}]$.

• Let $\overline{\tau}(\gamma) = \min\{\tau^N(\gamma), \overline{\tau}\}$. A 3-equation system in $(\underline{v}, \overline{v}, \gamma^*)$:

  \[
  \underline{v} = \int_{\overline{\tau}} \overline{W}_x(\overline{\tau}(\gamma); \gamma) dH(\gamma) + H(\gamma^*) \delta \underline{v} + \int_{\gamma^*} \overline{W}_x(\tau; \gamma) dH(\gamma) + (1 - H(\gamma^*)) \delta \overline{v}
  \]

  \[
  \overline{v} = \int_{\overline{\tau}} \overline{W}_x(\overline{\tau}(\gamma); \gamma) dH(\gamma) + \delta \underline{v}
  \]

  \[
  W_x(\overline{\tau}; \gamma^*) + \delta \underline{v} = W_x(\tau; \gamma^*) + \delta \overline{v}
  \]

• Lemma: There exists a unique $\gamma^* \in (\gamma^N(\overline{\tau}), \overline{\gamma})$ solving this system.

• On-Schedule now satisfied via dynamic incentives.

• Off-schedule deviations - apply $\tau > \tau$, or $\tau > \overline{\tau}$ in state 2 - lead to Nash punishment.
Prop. 6: There exists $\varepsilon^* > 0$ and $\delta^* < 1$ such that, for all $\varepsilon \in (0, \varepsilon^*)$ and $\delta \in (\delta^*, 1)$, there exists a non-stationary equilibrium for the repeated game in which, along the equilibrium path, governments select the applied tariffs induced by the two-state dynamic binding system in which $\tau = \tau_w^R$ and $\tau = \tau_w^R + \varepsilon$.

Prop. 7: Suppose that the distribution function, $H(\gamma)$, is uniform. Suppose further that the discount factor $\delta < 1$ is sufficiently large that equilibria for the repeated game exist in which governments select the applied tariffs induced by (i) the optimal weak tariff binding, $\tau_w^R$, and (ii) the two-state dynamic binding system in which $\tau = \tau_w^R$ and $\tau = \tau_w^R + \varepsilon$. If $\varepsilon > 0$ is sufficiently small, then the two-state dynamic binding system generates strictly higher discounted game welfare than does the optimal weak tariff binding, $\tau_w^R$.

Upshot: Dynamic Use Constraint raises efficiency by generating better matching of tariffs and privately observed information. It does this while achieving incentive compatibility, by introducing a dynamic opportunity cost for high tariffs.
6 Conclusion

- Strong versus Weak Bindings
  Govt’s prefer weak bindings
  Optimal weak tariff binding is higher
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