Introduction

- Originally a Background Study for the WTO *World Trade Report 2012* on NTMs

- A unified framework (slight generalization of Staiger and Sykes, 2011) to evaluate rationale for agreements about regulatory protectionism
  - from perspective of ToT theory
  - from perspective of Offshoring theory
Regulatory protectionism an important issue to developing countries:

“...A more systematic account of developing countries’ perceptions of non-tariff barriers comes from the notification process established under the auspices of NAMA... TBTs represent the NTB category with the highest incidence of notifications with 530 entries, or almost half of the total, followed by Customs and Administrative Procedures (380 entries) and SPS measures (137 entries). Quantitative restrictions, trade remedies, government participation in trade, charges on imports, as well as other barriers amount to less than 5% of total NTB entries.” (OECD 2005, pp. 230-234).

Some behind-the-border regulatory measures, some border regulatory measures
Introduction

- So far, paper focuses on regulatory protectionism behind the border
- But WTO Trade Facilitation Agreement (TFA) is about regulatory protectionism at the border
- Currently extending paper to provide a ToT evaluation of TFA
- Motivated by recent draft of WTO World Trade Report 2015 on TFA

“...A trade agreement, according to the terms-of-trade theory, allows countries to derive benefits from reciprocally reducing their tariffs, thereby escaping the prisoners’ dilemma. This rationale, however, is unlikely to play an important role in explaining an agreement on trade facilitation if trade facilitation is mostly about reducing trade costs.”
Plan of Talk

- Review rationale for agreements about behind-the-border regulatory protectionism from perspective of ToT theory (Staiger and Sykes, 2011)

- Sketch rationale for TFA from perspective of ToT theory

- Review rationale for agreements about regulatory protectionism from perspective of Offshoring theory (Antràs and Staiger, 2012a,b)
Existing models of trade and regulatory policy suggest potential for a regulatory race to the bottom: (e.g., Bagwell and Staiger 2002, ch 9)

Once tariffs and other border instruments are “bound,” countries might lower their regulatory standards to advantage their firms against foreign competitors

Ederington (2009) surveys the recent body of empirical research that lends some support to the concerns emphasized by these models

One sees some legal response in trade agreements, particularly the NAFTA side agreements
WTO rules and disputes, however, center on complaints about excessively stringent regulations (e.g., Beef-Hormones, Asbestos, Shrimp-Turtle)

Legal obligations that explicitly address national regulatory policies are limited to non-discrimination rules: GATT Article III, TBT, SPS

- do not place legal constraints on countries that wish to lower domestic regulatory standards
- rather, they restrict the ability of member governments to impose regulations on foreign suppliers

Stricter regulation of foreign products appears to *worsen* ToT

- seems at odds with ToT theory
Here we bridge the gap between the existing formal literature and the actual pattern of rules and disputes

Key distinction:
- Existing models focus on standards applicable to domestic production processes only
- We focus on product standards, applicable to imported and domestic products alike

We employ the ToT framework for the modeling of trade agreements between “large” countries

⇒ incentive to discriminate against imported goods in regulatory policy once border instruments are constrained
⇒ inefficiently stringent regulation may emerge under certain circumstances even if regulatory discrimination is prohibited
⇒ a foundation for shallow integration based on tariff bindings, non-discrimination and non-violation
A simple partial equilibrium model of trade between a domestic and a foreign country, with ‘*’s denoting foreign variables.

The product under consideration is produced in both countries but only demanded in the domestic country:

\[ D = \alpha - P, \]

with \( P \) the consumer price of this good in the domestic market.

Consumption of the good generates an “eye sore” pollutant that does not cross borders.

The domestic government can impose a regulatory standard:

- specifies a (maximum) level of pollution generated per unit of the good consumed
- may differ across domestically produced and imported units
The Basic Idea (cont’d)

- The domestic government also has at its disposal an import tariff $\tau$ and a consumption tax $t$ (all taxes expressed in specific terms).
- The foreign government has an export tax $\tau^*$.
- Assuming all taxes set at non-prohibitive levels, domestic consumer and producer price/domestic and foreign producer price relations:

$$P = q + t, \text{ and } q = q^* + \tau + \tau^*.$$

- Note: all units of the product sell in the domestic country at the same price $P$ regardless of the standard to which they are produced ("eye sore" pollutant).
- Define the "world" producer price (i.e., the price at which the good is available for sale in international markets once it clears customs in the exporting country):

$$q^w \equiv q^* + \tau^* = q - \tau.$$
Market clearing – the volume of domestic imports must equal the volume of foreign exports:

\[ D - S = S^* , \]

determines the market-clearing world price as a function of the tax and regulatory policies:

\[ \tilde{q}^w = \frac{1}{3} [\alpha - 2\tau + \tau^* - t + \phi(r) + \phi^*(\rho)] . \]

Market-clearing levels of each of the other prices as functions of the tax and regulatory policies – \( \tilde{P} \), \( \tilde{q} \) and \( \tilde{q}^* \) – then also determined through earlier pricing relationships

Note: \( \tilde{q}^w \) increasing in \( \rho \)

- stricter regulation of foreign product appears to worsen domestic ToT
- but stricter regulation of foreign product also changes the product
Define the market-clearing foreign producer price of the “raw” unregulated good – prior to bringing it into compliance with the prevailing regulatory standard:

\[ \tilde{q}_0^* \equiv \tilde{q}^* - \phi^*(\rho) = \frac{1}{3}[\alpha - 2(\tau + \tau^*) - t + \phi(r) - 2\phi^*(\rho)] \]

And the associated world price of the foreign-produced unregulated good:

\[ \tilde{q}_0^w \equiv \tilde{q}^w - \phi^*(\rho) = \frac{1}{3}[\alpha - 2\tau + \tau^* - t + \phi(r) - 2\phi^*(\rho)] \]

We refer to \( \tilde{q}_0^w \) rather than \( \tilde{q}^w \) as the terms of trade, although for any \( \rho \) there is a one-to-one mapping between the two.
The Basic Idea (cont’d)

- Incentive to discriminate against imported goods in regulatory policy once border instruments are constrained

\[
\tilde{q}_0^w \equiv \tilde{q}^w - \phi^*(\rho) = \frac{1}{3}[\alpha - 2\tau + \tau^* - t + \phi(r) - 2\phi^*(\rho)]
\]

- Inefficiently stringent regulation may emerge under certain circumstances even if regulatory discrimination is prohibited
  - Under National Treatment \((r = \rho)\) and symmetry \((\phi = \phi^*)\)

\[
\tilde{q}_0^w \equiv \tilde{q}^w - \phi(r) = \frac{1}{3}[\alpha - 2\tau + \tau^* - t - \phi(r)]
\]

- From here, straightforward to show:
  - a single Nash inefficiency (tariffs too high)
  - a foundation for shallow integration based on tariff bindings, non-discrimination and “market access preservation” rule
Simple intuition: Figure 3.2 from WTO draft WTR2015

But notice: gains from elimination of inefficient custom procedures in (large) importing country are shared by importing country and exporting country

- world (foreign exporter) price rises from $P_{w}'$ to $P_w$

If addressing inefficiencies in custom procedures requires costly investments (e.g., modernizing ports, implementing IT advances),

- from a global perspective too little investment will be undertaken unilaterally by (large) importing country
trade is inefficiently low. A trade agreement, according to the terms-of-trade theory, allows countries to derive benefits from reciprocally reducing their tariffs, thereby escaping the prisoners' dilemma. This rationale, however, is unlikely to play an important role in explaining an agreement on trade facilitation if trade facilitation is mostly about reducing trade costs. If a small country uses inefficient customs procedures and practices, it will raise the cost of its imports and also reduce the profits from its exports, which, with given world prices, will reduce its terms-of-trade. Similarly, inefficient customs procedures will raise a large country's trade costs and lower its terms-of-trade. As shown in Figure 3.2, inefficient procedures will raise the domestic price to \( P_w+c \) and reduce the demand for imports which, if the country is large enough, may push down the world price from \( P_w \) to \( P_w' \). While in the case of a tariff, this reduction of the world price generates a terms-of-trade gain equal to the red surface, it generates a loss equal to the same surface in the case of inefficient customs procedures. Overall, the welfare effect of an increase in inefficiency will be a large deadweight loss equal to the sum of the yellow and the red surface. This means that trade facilitation which addresses cost-raising inefficiencies inevitably improves a country's terms-of-trade. There is no scope for beggar-thy-neighbour terms-of-trade manipulation and thus no terms-of-trade driven prisoners' dilemma to escape from. Only when customs procedures and practices can be manipulated to generate rents and governments can be captured by private interests may countries end up in a terms-of-trade driven prisoners' dilemma.

Figure 3.2: Impact of inefficient custom procedures on welfare

The second rationale is that trade agreements can help governments address a credibility problem. The idea is that governments value trade agreements as a way to tie their hands against lobbies and citizens.\(^{32}\) According to Hoekman (2014), this theory does not help much understand the rationale behind a trade facilitation agreement because trading partners would not be in a position to enforce an agreement by threatening to withdraw concessions. It would, indeed, be difficult for a government to selectively "unwind" trade facilitation measures to enforce a trade facilitation agreement. If, however, the agreement foresees the possibility of using other enforcement instruments, as is the case for the WTO TFA, it may allow governments to tie their hands against anti-facilitation lobbies. In other words, commitment may be one of the rationales behind the TFA.

\(^{32}\) See (Maggi and Rodriguez-Clare, 1998; Maggi and Rodriguez-Clare, 2007), (Matsuyama, 1990), (Staiger and Tabellini, 1987) and (World Trade Organization (WTO), 2012).
A competitive (market clearing) ToT framework bears out this simple intuition:

- with tariffs unconstrained, Nash investment in trade facilitation (reduction in transport costs) is efficient
- with tariff constrained below Nash, non-cooperative investment in trade facilitation will be inefficiently low
- in principle a non-violation clause would work to address this

But as these are border regulatory measures, direct negotiation as in TFA does not raise sovereignty issues as in behind-the-border “deep” integration and may be preferred approach
Terms-of-Trade Theory of Trade Agreements:

- in the Nash equilibrium, tariffs are inefficiently high but domestic policies are internationally efficient
- negotiations over tariffs alone, coupled with a “market access preservation rule,” can bring governments to the efficiency frontier – “shallow” integration

Nature of international price determination is important for these predictions:

- “deep” integration needed when prices are not fully disciplined by market clearing (bilateral bargaining)
Perfectly competitive trade model: Foreign (‘*’) exports a single good to Home

Measure $\frac{1}{2}$ of H consumers with demand $D(p)$

Measure $\frac{1}{2}$ of F consumers with demand $D(p^*)$

Measure 1 of firms in F with increasing-concave production technology $y^* = F(L^*)$

Measure $\Lambda$ of workers in each country paid a wage of 1 (pinned down by outside sector)
H has import tariff $\tau$, F has both export tax $\tau^*$ and labor subsidy $s^*$ (applied only to the export sector), all defined in specific terms.

Governments are social welfare maximizers ($W$ and $W^*$).

Efficient policies maximize world welfare and deliver $T^e \equiv \tau^e + \tau^{*e} = 0$, $s^{*e} = 0$. No surprise (no frictions).

Nash policies: FOCs $\Rightarrow \tau^N = \hat{p}^* / \eta^*_E$, $\tau^{*N} = \hat{p} / \eta^*_M$ and $s^{*N} = 0$ (where all prices and elasticities are evaluated at the Nash policies).

Why isn’t $s^{*N}$ distorted? $\tau^*$ is first best for terms of trade manipulation in this setting.
• **Shallow integration:** Suppose H agrees to eliminate its tariff and F agrees to eliminate its tariff and in addition F agrees to a "market access preservation" constraint on its future choices of \( s^* \):

\[
\frac{d\tau^*}{ds^*} = -\frac{d\hat{p}/ds^*}{d\hat{p}/d\tau^*}
\]

• Reflects essential mission of GATT/WTO rules: provide secure property rights over negotiated market access

• Then F solves

\[
\frac{dW^*}{ds^*} = \frac{\partial W^*}{\partial s^*} - \frac{\partial W^*}{\partial \tau^*} \frac{d\hat{p}/ds^*}{d\hat{p}/d\tau^*} = 0
\]

with \( W^* \) evaluated at \( \tau = 0 \)

• Delivers \( s^{*R} = 0 \) and \( \tau^{*R} = 0 \). Hence, with \( \tau = 0 \), efficiency frontier achieved
Matching Model

- Now suppose international prices determined by bilateral bargaining

- Measure 1 of consumers each matched with measure 1 of producers; no possibility of rematching (0 outside option of the agents)
  - extreme assumption but results generalize to any pricing not fully disciplined by market clearing

- Each producer produces an amount of $x$ with the production function $F(L)$ in anticipation of payoff obtained upon matching

- Consumer utility $u(x)$, where $u$ is increasing and concave

- With cost of producing $x$ sunk at time of matching, consumer and producer Nash bargain over the surplus, with producer capturing share $\alpha \in (0, 1)$
Matching Model

- **International match**: F seller takes her good to H market; tariff costs not sunk at time of bargaining, so ex-post surplus over which parties negotiate is

\[ S(L, \tau + \tau^*) \equiv u(F(L)) - (\tau + \tau^*) F(L) \]

- Labor \( L \) hired by F selling to H is then determined by maxing \( \alpha S(L, \tau + \tau^*) - (1 - s^*) L \), which defines \( \hat{L}(s^*, \tau + \tau^*) \) and trade volume \( F(\hat{L}) \)

- **Local (F) match**: tariffs irrelevant to bargaining surplus, so labor hired by F selling to F is \( \hat{L}^*(s^*) \) and production for local sales is \( F(\hat{L}^*) \)
Matching Model

- Efficient policies $T^e = 0, \ s^* = 1 - \alpha$: no role for tariffs, and F labor subsidy resolves the under-investment in $L$
- Nash policies: FOCs $\Rightarrow \tau^N + \tau^*$ $> 0, \ s^N > 1 - \alpha$
- Hence, $T^N > T^e$, but now $s^N$ is inefficient even conditional on trade volume
Consider F’s preferred $\tau^*$ and $s^*$ to deliver efficient trade volume.

Efficient trade volume is $F(\hat{L}(1 - \alpha, 0))$, so starting from efficient policies changes in $\tau^*$ and $s^*$ must satisfy

$$\frac{d\tau^*}{ds^*} = -\frac{d\hat{L}/ds^*}{d\hat{L}/d\tau^*}$$

Then F solves

$$\frac{dW^*}{ds^*} = \frac{\partial W^*}{\partial s^*} - \frac{\partial W^*}{\partial \tau^*} \frac{d\hat{L}/ds^*}{d\hat{L}/d\tau^*} = 0$$

Delivers $s^R > s^e$. Hence, shallow negotiations cannot achieve the efficiency frontier.
Matching Model: Another Interpretation

- “World” /exporter price:

\[
\hat{p}^w = \frac{\alpha u(F(\hat{L}))}{F(\hat{L})} + (1 - \alpha) \tau^* - \alpha \tau
\]

- But \( -\frac{d\hat{L}}{ds^*} > 0 \), so \( F \) maintains trade volume with an increase in \( \tau^* \) and \( s^* \) while raising \( \hat{p}^w \) and improving its terms of trade.

- Shallow integration cannot fully eliminate terms-of-trade manipulation when international prices are determined through bargaining.

- But if negotiations impose \( s^* = s^{*e} \) (i.e., “deep” integration), then efficiency frontier is immediately achieved.
According to ToT theory, Nash tariffs inefficiently high but domestic policies internationally efficient, market access/shallow integration approach can achieve efficiency

But when prices are not fully disciplined by market clearing (bilateral bargaining), deep integration needed

How much are international prices disciplined by market clearing?
  - arguably less and less so with the increase in offshoring (Antràs and Staiger 2012b)

How sensitive is the performance of the market-access/shallow integration approach to the nature of international price determination?
  - some suggestive evidence: rise of deep-integration FTAs (Orefice and Rocha 2014)

Important questions for the architecture of the WTO moving forward