The “New” Economics of Trade Agreements: From Trade Liberalization to Regulatory Convergence?

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Introduction

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  - TBT and SPS Agreements, TTIP negotiations in response
- Lamy (2015, 2016) highlights a particular form of international externality that arises from regulatory heterogeneity:
  - firms that must satisfy different regulations across markets may face a substantial cost in the form of foregone economies of scale.
Design Modifications Due to Differences between Current U.S. and EU Safety Regulations

A number of vehicle modifications are necessary to allow a vehicle sold in Europe to also be sold in the United States and vice versa. These modifications include changes to componentry, vehicle subsystems, and the underlying design of the vehicles. CAR reviewed differences within the regulations, as well as interviewed several manufacturers to develop a list of vehicle modifications required due to differing U.S. and European regulations.

A summary of the identified modifications is provided in Figure 1 and Table 2; the table defines the numbers shown in the figure. In addition to modifications required for regulatory purposes, some of the examples given are due to non-regulatory test standards. A more detailed description of these modifications is located in Appendix A.

The financial burden of these modifications varies by application, and a component-level change might or might not carry the same burden as a design-level change.

*Figure 1. Areas of vehicles requiring component, sub-system, and design-level modifications as a result of differing U.S. and European safety regulations*
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  • firms that must satisfy different regulations across markets may face a substantial cost in the form of foregone economies of scale
• Yet as Sykes argues, international differences in incomes, cultures and tastes generally justify at least some regulatory heterogeneity.
• What is the appropriate trade-off in international trade agreements between heterogeneous tastes across international borders and the extra costs imposed by disparate regulations?
To explore this question, we extend the Venables (1987) model:

- trade in horizontally differentiated products under monopolistic competition in the presence of a competitively produced ‘outside’ good
- features a “delocation” motive for unilateral policies
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We introduce a second dimension of differentiation along which the residents of different countries have different ideals. An individual pays a utility cost from consuming any good that differs from her ideal along this dimension. The loss of utility enters as a ‘demand shifter’ in a familiar CES formulation, possibly with an externality.
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We allow firms in the differentiated product sector to tailor their brands to the alternative destination markets. If firms supply different versions of their brands, they bear a fixed cost of design adaptation.
Introduction

- Findings
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Without some institutional constraints on standards setting, the incentives to distort standards so as to favor local firms are extreme.

- can be tempered but not eliminated in an OTA that adopts a “smart” approach to setting efficient net trade taxes

In the absence of consumption externalities, national treatment can help, but mutual recognition dominates as an institutional rule under which OTAs can achieve the first best.

In the presence of consumption externalities – even ones that do not cross borders – neither national treatment nor mutual recognition allows countries to achieve in an OTA what they can in an NTA.

Related Literature

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**Related Literature**

Demand (absent externalities)

In the absence of externalities, the bundle of differentiated goods that comprise $C_D^J$ in country $J \in \{H, F\}$ is defined by

$$C_D^J = \left\{ \sum_{i \in \Theta^J} \left[ A - (a_i^J - \hat{a}^J)^2 \right] (c_i^J)^\beta \right\}^{\frac{1}{\beta}}$$

with $a_i^J \in [0, 1]$ and $1 > \hat{a}^H > \hat{a}^F > 0$.
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\]

with \( a_i^J \in [0, 1] \) and \( 1 > \hat{a}^H > \hat{a}^F > 0 \)

With \( P^J \) the appropriate industry-level price index for \( C_D^J \) and \( I^J \) per-capita disposable income in \( J \),

\[
V \left( P^J, I^J \right) = I^J - \log P^J; \quad \text{and} \quad C_D^J = \frac{1}{P^J}
\]

\( N^J \) citizens in country \( J \)
Per capita demand for brand $i$ in country $J$ is

$$c_i^J = \left( A_i^J \right)^\sigma \left( p_i^J \right)^{-\sigma} \left( P^J \right)^{\sigma-1}$$

where $A_i^J \equiv A - \left( a_i^J - \hat{a}^J \right)^2 > 0$, $\sigma = 1 / (1 - \beta)$ and

$$P^J \equiv \left[ \sum_{i \in \Theta^J} \left( A_i^J \right)^\sigma \left( p_i^J \right)^{1-\sigma} \right]^{-\frac{1}{\sigma-1}}$$
Supply

- A constant marginal cost of production $\lambda$
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Fixed costs of a firm selling brand $i$ depend on design choices

$$K + \kappa \left( a_i^H - a_i^F \right)^2$$
Supply

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- Fixed costs of a firm selling brand $i$ depend on design choices

\[ K + \kappa \left( a_i^H - a_i^F \right)^2 \]

- Trade costs are composed of iceberg costs, and ad valorem export taxes and import tariffs

\[ \iota^J = 1 + \phi + e^J + \tilde{\tau}^J \]
Each country may also subsidize/tax consumption of differentiated products at an ad valorem (nondiscriminatory) rate $s^J$. 

Hence the consumer price of a typical local brand in country $J$ is 

$$p^J = q^J - s^J,$$

while the consumer price of an imported brand in country $J$ is 

$$p^J = q^J - s^J - q^J.$$
Each country may also subsidize/tax consumption of differentiated products at an ad valorem (nondiscriminatory) rate $s^J$

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$$p^J_J = q \left( 1 - s^J \right), \ J = H, F$$

while the consumer price of an imported brand in country $J$ is

$$p^J_j = \left( 1 - s^J \right) q \tilde{i}^J, \ J = H, F$$
Supply in Unregulated Markets

- Suppose firms have free rein to design their products
- How does a firm choose its product design for the goods it will sell on its local and export markets?

\[ \hat{\alpha}_H > \alpha_H > \alpha_F > \hat{\alpha}_F \]

Grossman, McCalman and Staiger. (Princeton, University of Melbourne and Dartmouth)
Supply in Unregulated Markets

- Suppose firms have free rein to design their products.
- How does a firm choose its product design for the goods it will sell on its local and export markets?
- A firm producing brand $i$ in country $J$ earns profits of

$$\pi_{ij} = (q - \lambda) \left[ N^j c_{ij} (a_{ij}) + (1 + \phi) N^j \tilde{c}_{ij} (\tilde{a}_{ij}) \right]$$

$$- \left[ K + \kappa (a_{ij} - \tilde{a}_{ij})^2 \right]$$
Supply in Unregulated Markets

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$$\pi_{iJ} = (q - \lambda) \left[ N^J c^J_{ij} (a_{ij}^J) + (1 + \phi) N^{\tilde{J}} c^{\tilde{J}}_{ij} (\tilde{a}_{ij}^J) \right]$$

$$- \left[ K + \kappa \left( a_{ij}^J - \tilde{a}_{ij}^J \right)^2 \right]$$

- The unregulated firm maximizes profits by designing its offerings so that $\hat{a}^H > a_{ij}^H > a_{ij}^F > \hat{a}^F$
Suppressing the dependence on prices and therefore trade taxes and consumption subsidies, the zero-profit conditions are

\[
N^J c^J \left( a^J, P^J \left( n, a^J_H, a^J_F \right) \right) + (1 + \phi) N^J c^J \left( a^J, P^J \left( n, a^J_H, a^J_F \right) \right) = K + \kappa \left( a^J - a^J \right)^2 \frac{q - \lambda}{q - \lambda}, \quad J = H, F
\]
Equilibrium

- Suppressing the dependence on prices and therefore trade taxes and consumption subsidies, the zero-profit conditions are

\[ N^j c_j^j (a^j, P^j (n, a^j_H, a^j_F)) + (1 + \phi) N^j c^j (a^j, P^j (n, a^j_H, a^j_F)) = K + \kappa \left( a^j - a^j \right)^2 \]
\[ q - \lambda, \quad J = H, F \]

- Solving the zero-profit conditions \(\Rightarrow\)

\[ n^j = n^j (a), \quad P^j = P^j (a), \quad J = H, F \]
Suppressing the dependence on prices and therefore trade taxes and consumption subsidies, the zero-profit conditions are

\[ N^J c^J_J \left( a^J_j, P^J \left( n, a^J_H, a^J_F \right) \right) + (1 + \phi) N^J c^{\tilde{J}}_J \left( a^{\tilde{J}}_j, P^{\tilde{J}} \left( n, a^{\tilde{J}}_H, a^{\tilde{J}}_F \right) \right) \]

\[ = K + \kappa \left( a^J_j - a^{\tilde{J}}_j \right)^2 \]

\[ = \frac{q - \lambda}{q - \lambda}, \quad J = H, F \]

Solving the zero-profit conditions ⇒

\[ n^J = n^J \left( a \right) , \quad P^J = P^J \left( a \right) , \quad J = H, F \]

Finally, for unregulated markets, we solve for the choices of \( a^J_j \) and \( a^{\tilde{J}}_j \) by firms producing in \( J \)

- where the firms take the number and composition of competitors, \( n \), and the industry-level price indexes \( P^H \) and \( P^F \), as given.
Lemma (1)

Consider the unregulated equilibrium with the profit-maximizing choices of characteristics. Beginning at this equilibrium, a small increase in any product characteristic induces exit by home firms and entry by foreign firms.
Lemma (2)

Consider the unregulated equilibrium with the profit-maximizing choices of characteristics. Beginning at this equilibrium, a small change in any product characteristic has no first-order effect on the home or foreign price index, i.e., $dP_H/da_{J'} = 0$ and $dP_F/da_{J'} = 0$ for all $J \in \{H, F\}$ and $J' \in \{H, F\}$.
For the representative consumer in country $J$, we have

$$V^J = I^J - \log P^J \quad \text{with} \quad I^J = L^J / N^J + R^J / N^J$$

where $R^J$ is the aggregate tax revenues in country $J$.
For the representative consumer in country $J$, we have

$$V^J = I^J - \log P^J \quad \text{with} \quad I^J = L^J / N^J + R^J / N^J$$

where $R^J$ is the aggregate tax revenues in country $J$.

We can write aggregate welfare in country $J$ as

$$\Omega^J (a, p, \rho) \equiv N^J V^J = L^J + R^J (a, p, \rho) - N^J \log P^J (a, p)$$

where $\rho$ is a vector of world prices and $a$ can be evaluated under regulation or in unregulated markets.
As usual, world prices drop out of global welfare

also, absent externalities, total spending on differentiated goods equals one: 

$$
\Omega (a, p) \equiv \sum_j L^j + \sum_j q \left( \tau^j + e^j \right) M^j (a, p) \\
- \sum_j N^j \log P^j (a, p) - \sum_j N^j \frac{s^j}{1 - s^j}
$$
In an “old trade agreement” (that includes a subsidies agreement)

- the two govs choose the net trade taxes, $z^H$ and $z^F$, and the subsidies, $s^H$ and $s^F$, to maximize $\Omega(\mathbf{a}, \mathbf{p})$
- the sovereign choices of standards might be unconstrained, or subject to institutional rules such as *national treatment* or *mutual recognition*
In an “old trade agreement” (that includes a subsidies agreement)
the two govs choose the net trade taxes, \( z^H \) and \( z^F \), and the subsidies, \( s^H \) and \( s^F \), to maximize \( \Omega (a,p) \)
the sovereign choices of standards might be unconstrained, or subject
to institutional rules such as *national treatment* or *mutual recognition*

Under a “new trade agreement,” the govs negotiate a set of product
standards along with net trade taxes and consumption subsidies
An efficient NTA maximizes $\Omega(a, p)$ with respect to $z$, $s$ and $a$.
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Global efficiency requires $z^H = z^F = 0$ and $s^H = s^F = 1/\sigma$.

- Efficient consumption subsidies offset the monopoly distortion.
- Net trade taxes different from zero can only harm world welfare once the optimal consumption subsidies are in place.
With $z = 0$ and $s = 1/\sigma$ in place, global welfare for any $a$ is

$$\Omega \left( a, p^E \right) \equiv \sum_j L^J - \sum_j N^J \log P^J \left( a, p^E \right) - \sum_j N^J \frac{1}{\sigma - 1}$$

where $p^E$ are the efficient prices implied by $z = 0$ and $s = 1/\sigma$. 
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To see how the globally-efficient product characteristics are determined, we borrow Figure 1 from Venables (1987)
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Our Figure 1 drawn with $N^H \left( P^H \right)^{\sigma - 1}$ and $N^F \left( P^F \right)^{\sigma - 1}$ on the axes

fixes $a$ at the levels that would emerge without gov regulation and with $z = 0$ and $s = 1/\sigma$
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\[
\frac{d \left[ \frac{N^F (P^H)^{\sigma-1}}{N^H (P^H)^{\sigma-1}} \right]}{d \left[ \frac{N^F (P^H)^{\sigma-1}}{N^H (P^H)^{\sigma-1}} \right]} \bigg|_{\pi^H = 0} = - (1 + \phi)^{\sigma-1} \left( \frac{A^H_H}{A^H_F} \right)^{\sigma} < -1 ,
\]

where the inequality follows from the fact that \( \phi > 0 \) and that \( A^H_H > A^F_H \) at the profit-maximizing choices, say \( \tilde{a}^H_H \) and \( \tilde{a}^F_H \). Similarly, the downward-sloping line labelled \( \pi^F = 0 \) gives the combinations of \( N^H (P^H)^{\sigma-1} \) and \( N^F (P^F)^{\sigma-1} \) that are consistent with zero profits for foreign firms when their two versions have characteristics \( \tilde{a}^H_F \) and \( \tilde{a}^F_F \). This line has a slope equal to

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\]

Also depicted in the figure are combinations of \( N^H (P^H)^{\sigma-1} \) and \( N^F (P^F)^{\sigma-1} \) that imply \( n^H = 0 \) and \( n^F = 0 \), respectively. These combinations are readily derived from the expressions for \( P^F \) and \( P^H \). As shown in the figure, the \( n^H = 0 \) locus is a ray from the origin with
Is the point $Q$ in Figure 1 efficient?
Figure 1: Optimal NTA

distort consumers’ allocation of spending between domestic and imported differentiated goods.

To see how the globally-efficient product characteristics are determined, we borrow Figure 1 from Venables (1987). Our Figure 1 is drawn with $N^H (P^H)^{\sigma-1}$ and $N^F (P^F)^{\sigma-1}$ on the axes, and our rendition fixes the product characteristics at the levels that would emerge without government regulation and with $z^H = z^F = 0$ and $s^H = s^F = 1/\sigma$. The downward-sloping line labelled $\pi^H = 0$ gives the combinations of $N^H (P^H)^{\sigma-1}$ and $N^F (P^F)^{\sigma-1}$ that are consistent with zero profits for home firms, in the light of (12). It has a slope equal to

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Proposition

Let $\tilde{\mathbf{a}}$ be the vector of product characteristics that result from profit-maximizing design choices in an unregulated equilibrium when $z^H = z^F = 0$ and $s^H = s^F = 1/\sigma$. Then the maximum world welfare is achieved in a monopolistically-competitive equilibrium when $z^H = z^F = 0$, $s^H = s^F = 1/\sigma$, and $\tilde{\mathbf{a}} = \tilde{\mathbf{a}}$.

- How could the globally efficient outcome be achieved with an NTA?
Proposition

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- How could the globally efficient outcome be achieved with an NTA?
  - First, the agreement must stipulate zero net trade taxes on all goods
    - prevents govs from using import tariffs for delocation and export taxes for delocation and TOT manipulation
Let $\tilde{a}$ be the vector of product characteristics that result from profit-maximizing design choices in an unregulated equilibrium when $z^H = z^F = 0$ and $s^H = s^F = 1/\sigma$. Then the maximum world welfare is achieved in a monopolistically-competitive equilibrium when $z^H = z^F = 0$, $s^H = s^F = 1/\sigma$, and $\bar{a} = \tilde{a}$.

- How could the globally efficient outcome be achieved with an NTA?

- First, the agreement must stipulate zero net trade taxes on all goods
  - prevents govs from using import tariffs for delocation and export taxes for delocation and TOT manipulation

- Second, as long as consumption subsidies abide by national treatment, the agreement need not stipulate that $s = 1/\sigma$
  - in this model, consumption subsidies have no impact on the TOT and under national treatment are unattractive as tools for delocation
$n^F = 0$

$\pi^H = 0$

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$n^H = 0$
Finally, how might the NTA address product standards?
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It could require the home and foreign govs to set product standards 
\((\bar{a}_H^H, \bar{a}_F^H) = (\tilde{a}_H^H, \tilde{a}_F^H)\) and 
\((\bar{a}_H^F, \bar{a}_F^F) = (\tilde{a}_H^F, \tilde{a}_F^F)\) respectively.

Or it could require the home and foreign govs to permit the range of product characteristics 
\([(\tilde{a}_F^H, \tilde{a}_H^H)]\) and 
\([(\tilde{a}_F^F, \tilde{a}_H^F)]\) respectively.

or both govs could promise not to regulate product characteristics at all.
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⇒ An NTA designed in this way would maximize joint welfare
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\(
\Rightarrow\) An NTA designed in this way would maximize joint welfare

Could an OTA maximize joint welfare while being silent on issues of 
product standards?
Suppose an OTA calls for free trade ($\tau = e = 0$), and consumption subsidies (but not standards) that conform to national treatment.

We find that the unilateral choices of consumption subsidies are chosen efficiently to offset monopoly pricing ($s = 1/\sigma$).

What regulatory standards will each gov choose?
Suppose an OTA calls for free trade \((\tau = e = 0)\), and consumption subsidies (but not standards) that conform to national treatment we find that the unilateral choices of consumption subsidies are chosen efficiently to offset monopoly pricing \((s = 1/\sigma)\)

What regulatory standards will each gov choose?

With \(\tau^J = e^J = 0\) and \(s^J = 1/\sigma\), the gov of each country \(J\) seeks with its choice of \(a^J_H\) and \(a^J_F\) to maximize

\[
\Omega^J (a, p, \rho) = L^J - N^J \log P^J (a, p) - N^J \frac{1}{\sigma - 1}
\]
Suppose an OTA calls for free trade ($\tau = e = 0$), and consumption subsidies (but not standards) that conform to national treatment.

- we find that the unilateral choices of consumption subsidies are chosen efficiently to offset monopoly pricing ($s = 1/\sigma$)

What regulatory standards will each gov choose?

With $\tau^J = e^J = 0$ and $s^J = 1/\sigma$, the gov of each country $J$ seeks with its choice of $a^J_H$ and $a^J_F$ to maximize

$$\Omega^J (a, p, \rho) = L^J - N^J \log P^J (a, p) - N^J \frac{1}{\sigma - 1}$$

⇒ the objective of each gov is simply to minimize the local price index
Would the home gov regulate its local firms?
An Old Trade Agreement without National Treatment

- Would the home gov regulate its local firms?
  - No: any regulation that requires a discretely different product characteristic than the profit-maximizing choice would shift the $\pi^H = 0$ line to the right at point $Q$, leading to a higher $P^H$. 

Might the home gov regulate imports?

Yes: any regulation that requires a discretely different product characteristic than the profit-maximizing choice would shift the $\pi^F = 0$ line to the right at point $Q$, resulting in a lower $P^H$. 

Notice that home gains by regulating imports in either direction.
\[ NF(P^f)(\sigma - 1) \]

\[ NH(P^H)(\sigma - 1) \]

\[ \pi^H = 0 \]

\[ \pi^F = 0 \]

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Notice that home gains by regulating imports in either direction

- How can we understand this welfare improvement?
Consider first a standard $\bar{a}_F^H$ that pushes foreign firms closer to $\hat{a}^H$

- home consumers benefit directly from goods with $\bar{a}_F^H$ closer to $\hat{a}^H$
- but $n^H$ falls and $n^F$ rises (Lemma 1) – anti-delocation
- direct effect dominates costs of anti-delocation and $P^H$ must fall
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- direct effect dominates costs of anti-delocation and $P^H$ must fall

Now consider a standard $a_F^H$ that pushes foreign firms further from $a^H$

- home consumers lose directly from goods with $a_F^H$ further from $a^H$
- but $n^H$ rises and $n^F$ falls (Lemma 1) – *delocation*
- now benefits of delocation dominate direct effect and $P^H$ must fall
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Either way, govs that are free to regulate products differently according to their source will apply pernicious standards to imports

$\Rightarrow$ the globally efficient outcome cannot be achieved with a free-trade agreement that is silent about regulation
Where does the process of non-cooperative regulation lead us?

For every pair of standards that applies to local products, each gov has a unilateral incentive to push its import standard to an extreme until it reaches a boundary of the product space and can go no further or one of the govs captures the entire world market for its local firms.

**Proposition**

Suppose \( \xi = 1, \tau = e = 0 \) and \( s = 1/\sigma \). Suppose governments are free to choose any standards for local products and for imported products, without need for national treatment. Then, in the Nash equilibrium of the standard-setting game, either (i) \( n^J = 0 \) for some \( J \in \{H, F\} \), or (ii) \( a^F_H \in \{0,1\} \) and \( a^H_F \in \{0,1\} \). The equilibrium level of global welfare is less than that attained under an NTA.
Suppose the OTA maintains zero net tariffs, but instead of setting \( \tau = e = 0 \) as in an FTA, sets \( \tau^H = \tau^F = -e^H = -e^F \equiv \tau > 0 \).
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- equilibrium prices and quantities are unchanged, but home welfare now

$$\Omega^H = L^H + \tau q (M^H - E^H) - N^H \log (P^H) - N^H \frac{1}{\sigma - 1}$$

so trade-tax revenue considerations arise
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- Beginning from $a^H_F = 1$, easing standards increases $P^H$, but $M^H$ rises and $E^H$ falls, increasing home tax revenues
A Smarter OTA without National Treatment

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  - first effect is independent of $\tau$; second effect rises linearly with $\tau$
  - if slope of $\pi^H = 0$ and $\pi^F = 0$ are steeper and flatter than $-1$, global welfare higher under a smarter OTA with $\tau > 0$ than under FTA
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- Still, a smarter OTA cannot get all the way to the first best (Figure 2)
foreign firms are delocated to the home-country market. So the incentive for the home country to defect toward the left from the efficient profit maximizing $a^H_F$ is due to delocation. But moving right from the profit maximizing level $a^H_F$, $P^H$ falls despite the fact that initially $n^F$ is rising and $n^H$ is falling. So the incentive to defect toward the right from the efficient profit maximizing $a^H_F$ is initially – in the interval $((a^H_F, a_{H1}^F) - not due to delocation; it is due instead to the direct impact on $P^H$ of having imports adopt a characteristic that is a little closer to the Home ideal $a^H$, and this direct impact dominates the (anti-) delocation effects here. Once we move into the interval $(a_{H1}^F, a_{H2}^F)$, both $n^H$ and $n^F$ are falling with further increases in $a^H_F$, so again the incentive for the home country to keep raising $a^H_F$ in this interval to lower $P^H$ is not due to delocation, but must still be due to the domination of the direct impact on $P^H$ of having imports adopt a characteristic that is a little closer to the Home ideal $a^H$. In the interval $(a_{H2}^F, a^H)$, we now have delocation and the direct impact described above both helping to push $P^H$ lower. But for the interval $(a^H, 1)$, the direct effect is now going the wrong way so it is the delocation effect that dominates at this point and keeps $P^H$ falling.

This illustrates why setting tariffs in a way that perfectly offsets the $P^H$-reducing incentives of the home government with countervailing revenue incentives will not be possible, because the $P^H$-reducing incentives themselves are not tied monotonically to the trade volume effects – and hence the potential trade tax revenue effects – of standards choices, and only reflect trade volume effects in a consistent way as $a^H_F$ approaches the extremes of 0 or 1. So while the judicious choice of (efficient) trade tax/subsidies can reduce the Nash distortions in standards from their extreme levels, it cannot eliminate these distortions completely, an observation we formalize in Proposition 3.
An FTA with National Treatment

- Can national treatment applied to standards solve the prisoner’s dilemma that arises from the urge to delocate?
- We return to an FTA, with $\tau^J = e^J = 0$ and $s^J = 1/\sigma$ for $J = H, F$
- We show that national treatment can mitigate the urge to delocate with standards, but cannot achieve the first best
  - under national treatment imported and locally produced goods must be offered the same options $\Rightarrow$ each gov chooses a single standard
  - first best requires four standards, national treatment delivers two

**Proposition**

Suppose $\zeta = 1$, $z^H = z^F = 0$ and $s^H = s^F = 1/\sigma$. Suppose each government is free to choose any standard or set of standards as long as they are offered to all firms irrespective of origin. Then, in the Nash equilibrium of the standard-setting game, the outcome is equivalent to one in which each government names a single standard, and it does not achieve the maximal level of global welfare that is attained by an NTA.
Can mutual recognition solve the prisoner’s dilemma that arises from the urge to delocate?

Under mutual recognition, each gov respects the legitimacy of the other country’s regulatory aims. Therefore, any product that meets standards in an exporting country is considered acceptable for sale in the importing country. Exporting firms have the choice of whether to meet the standards of the destination market or their local country.

Suppose the gov of country $J$ announces $\bar{a}_J$ or $\bar{a}_2$. Mutual recognition implies that country-$J$ firms must produce a version with $\bar{a}_1^J$ or $\bar{a}_2^J$ for local sales but they can choose to meet any of the four legal standards for their sales in country $J$. What standards will the govs set in a noncooperative equilibrium, if subject to an FTA with mutual recognition?
An FTA with Mutual Recognition

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- Under mutual recognition, each gov respects the legitimacy of the other country’s regulatory aims
  - therefore, any product that meets standards in an exporting country is considered acceptable for sale in the importing country

Suppose the gov of country J announces $a_1$ or $a_2$. Mutual recognition implies that country-J firms must produce a version with $a_1$ or $a_2$ for local sales but they can choose to meet any of the four legal standards for their sales in country J.
An FTA with Mutual Recognition

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An FTA with Mutual Recognition

- We show: each gov will choose the product characteristics that maximize profits for its own representative national firm
- But these are the standards that would emerge under a globally efficient NTA
- A caveat: under terms of the European Union treaty, a firm can invoke mutual recognition in its export market only if it also supplies a similar good to its local market

Proposition

Suppose \( \zeta = 1, \tau^H = \tau^F = e^H = e^F = 0 \) and \( s^H = s^F = 1/\sigma \). Suppose that each government is free to choose two or more standards for local sales and that firms can invoke mutual recognition for export sales of any product that can legally be sold in its native market. Then, in the Nash equilibrium of the standard-setting game, each government will set two or more standards and the outcome is the same as in the globally efficient NTA.
What changes with $\xi < 1$?

The bundle of differentiated goods that comprise $C^J_D$ in country $J \in \{H, F\}$ is defined by

$$C^J_D = \left\{ \sum_{i \in \Theta^J} \left[ A - \xi \left( a^J_i - \hat{a}^J \right)^2 \right] (c^J_i)^\beta -(1 - \xi) \left( a^J_i - \hat{a}^J \right)^2 (c^J_{i\mu})^\beta \right\}^{1/\beta}$$

with $a^J_i \in [0, 1]$ and $1 > \hat{a}^H > \hat{a}^F > 0$
A New Trade Agreement when Externalities are Present

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- The bundle of differentiated goods that comprise $C^J_D$ in country $J \in \{H, F\}$ is defined by

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with $a^J_i \in [0, 1]$ and $1 > \hat{a}^H > \hat{a}^F > 0$

- $\zeta$ does not impact the total disutility that the representative consumer bears from local consumption of less-than-ideal varieties
  - $\zeta$ only impacts the composition between own and others’ consumption
The efficient product characteristics, quantities of per-brand consumption and numbers of home/foreign firms don’t change with $\zeta$

- rather, $\zeta$ determines the policies needed to achieve these outcomes
- when $\zeta < 1$, profit maximizing choices of standards are no long efficient
A New Trade Agreement when Externalities are Present

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- ∴ An FTA with mutual recognition cannot achieve first best when $\zeta < 1$, because firms may not self-select into first-best standards
  - and even if firms would self-select as desired, govs could delocate by granting favorable standards to their exporting firms while bearing none of the externality generated cost
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In the presence of consumption externalities – even ones that do not cross borders – the requirements for cooperation are more severe
Conclusion

- We have studied the need for NTAs when goods are horizontally differentiated and ideal product attributes differ across countries.

- Without some institutional constraints on standards setting, the incentives to distort standards so as to favor local firms are extreme.
  - Can be tempered but not eliminated in an OTA that adopts a “smart” approach to setting efficient net trade taxes.

- In the absence of consumption externalities, national treatment can help, but mutual recognition dominates as an institutional rule under which OTAs can achieve the first best.

- In the presence of consumption externalities – even ones that do not cross borders – neither national treatment nor mutual recognition allows countries to achieve in an OTA what they can in an NTA.