Equilibrium trade in manufactured goods is

$$x^{\star}_{ij}(\tau_i) + x^{\star}_{ji}(\tau_j)$$

And total trade is

$$x^{\star}_{ij}(\tau_i) + x^{\star}_{ji}(\tau_j) + \mid x^{\star}_{ij}(\tau_i) - x^{\star}_{ji}(\tau_j) \mid$$

where $\mid x^{\star}_{ij}(\tau_i) - x^{\star}_{ji}(\tau_j) \mid$ is the (market clearing) value of agricultural trade. We have established that $x^{\star}_{ij}(\tau_i)$ and $x^{\star}_{ji}(\tau_j)$ are decreasing in each country's tariff rate. It therefore remains to show that $\tilde{\tau}^{\star}_i(a_i, a_j)$ and $\tilde{\tau}^{\star}_j(a_i, a_j)$ are decreasing in a_i, a_j. First, $\frac{\partial \tilde{\tau}^{\star}_i(a_i,a_j)}{\partial a_i} < 0$ because the cross partial

$$\begin{aligned}
\frac{\partial \tilde{G}_i(\tilde{\tau}_i)}{\partial \tilde{\tau}_i} &= (1 - F(W_j(a_j, a_i) - G_j(\cdot, \tilde{\tau}_i|a_j))) \frac{\partial^2 G_i(\tilde{\tau}_i)}{\partial \tilde{\tau}_i^2} - \frac{1}{\bar{c}_j - \underline{c}_j} \frac{\partial W_j(a_j, a_i)}{\partial a_i} + \frac{1}{\bar{c}_j - \underline{c}_j} \frac{\partial G_j(\cdot, \tilde{\tau}_i|a_j)}{\partial \tau_i} \left(\frac{\partial G_i(\tilde{\tau}_i, \cdot;}{\partial \tilde{\tau}_i} \right. \\
&= (1 - F(W_j(a_j, a_i) - G_j(\cdot, \tilde{\tau}_i|a_j))) \frac{\partial^2 G_i(\tilde{\tau}_i)}{\partial \tilde{\tau}_i^2} - \frac{1}{\bar{c}_j - \underline{c}_j} \frac{\partial W_j(a_j, a_i)}{\partial a_i} + \frac{1}{\bar{c}_j - \underline{c}_j} \frac{\partial G_j(\cdot, \tilde{\tau}_i|a_j)}{\partial \tau_i} (V_i(\tilde{\tau}_i) - (\rho
\end{aligned}$$

is negative.

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