Online Appendices to "Heterogeneous Effects of Economic Integration Agreements"

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Contents

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Online Appendix 1: Closed-Economy Melitz Model with Exogenous and Endogenous Fixed Costs

The Melitz-Chaney model is now well known, cf., Melitz (2003), Chaney (2008), Redding (2011), Krautheim (2012), and Melitz and Redding (2014). The key distinction between the Melitz and Chaney approaches is that the former allows an endogenous number of firms in each country, firm exit and entry, and labor-market clearing. In this paper and appendices, we modify the Melitz model to incorporate additively the endogenous fixed costs introduced in Krautheim (2012), which chose the Chaney approach and had a multiplicative interaction of exogenous and endogenous fixed costs. So the essential difference of our approach to these two standard approaches is that we introduce *additively separable* exogenous and endogenous fixed costs into an otherwise standard Melitz model. The purpose of Appendices 1 and 2 is to show that, even with the additively separable exogenous and endogenous fixed costs, a sufficient condition for existence and uniqueness of a stable zero-cutoff productivity (and average firm profit level) is identical to that in Krautheim (2012), namely, $\frac{\gamma\eta}{\sigma-1} < 1$. However, unlike previous approaches in Krautheim (2012), Melitz and Redding (2015), and Novy (2013), our model can generate endogenous trade elasticities of trade-cost changes even with CES preferences and an untruncated Pareto distribution for productivities.[1]

Because this is the first paper to incorporate additively separable exogenous and endogenous fixed costs into a Melitz model with free entry and exit and labor-market clearing, for transparency we first follow Melitz (2003) and show the condition necessary for existence and stability of an equilibrium in the simple *closed-economy* case. For brevity, we follow closely, but concisely, in this appendix Melitz (2003), sections 2-4 and his Appendix B, modified only to incorporate additively separable endogenous fixed costs. Specifically, our goal is to generate the analogous conditions to equations (12) in Melitz (2003, p. 1703) for determining the (equilibrium) zero-cutoff productivity level and average firm profit level.

Consumers (workers) are identical and have the utility function:

$$U = \left(\int_{\omega \in \Omega} q(\omega)^{\frac{\sigma-1}{\sigma}} d\omega \right)^{\frac{\sigma}{\sigma-1}} \tag{1}$$

where $q(\omega)$ denotes the quantity consumed of product ω from the set of varieties Ω available and σ is the elasticity of substitution in consumption across varieties ($\sigma > 1$). Consumers

[1] As will become apparent, we will not be able to solve for a closed-form solution for the zero-cutoff productivity level; we will show that a stable equilibrium exists and is unique under the same condition as in Krautheim (2012). Technically, Krautheim (2012) also could not solve for a closed-form zero-cutoff productivity. As he noted, "The 'proper' multilateral resistance term in the spillover model should thus include the full fixed costs of exporting to country j. Due to the spillover, however, the fixed costs depend on the price index P_j.... This implies that writing the price index P_j as a function of the 'proper' multilateral resistance term would only deliver an implicit solution for P_j" (Krautheim (2012), p. 30).

maximize utility subject to a standard income constraint yielding a demand function in country j for variety ω imported from country i:

$$q(\omega) = Q\left(\frac{p(\omega)}{P}\right)^{-\sigma} \tag{2}$$

where $Q \equiv U$ as in Dixit and Stiglitz (1977) and Melitz (2003), $p(\omega)$ is the price of variety ω, and $P = [\int_{\omega\in\Omega} p(\omega)^{1-\sigma} d\omega]^{\frac{1}{1-\sigma}}$. It follows that:

$$r(\omega) = R\left(\frac{p(\omega)}{P}\right)^{1-\sigma} \tag{3}$$

where $R = PQ = \int_{\omega\in\Omega} r(\omega)d\omega$ denotes aggregate expenditure.

A continuum of firms exists that produce differentiated varieties in a single monopolistically-competitive industry and have heterogeneous productivities φ with the distribution $G(\varphi)$. There is one factor of production, labor, supplied inelastically at the aggregate level L, which indexes the size of the economy. As in Melitz (2003), the cost function has a constant marginal cost and a "fixed" overhead cost. Modifying Melitz (2003), the overhead cost is a function of the typical exogenous portion, f, and an additively separate endogenous portion, denoted $[M(\varphi^*)]^{-\eta}$, where M denotes the endogenous equilibrium number of firms in the economy, a *negative* function of zero-profit cutoff productivity φ^*. The economic rationale for the endogenous fixed cost specification is that, for given labor endowment L, a lower zero-profit cutoff (ZPC) productivity φ^* enlarges the number of firms in the economy, which then reduces overhead costs. Hence, $\eta > 0$. We will show that the same assumption in Krautheim (2012) to ensure an interior solution (namely, $\frac{\gamma\eta}{\sigma-1} < 1$) is sufficient to ensure existence and uniqueness of a stable equilibrium (and also implies $0 < \eta < 1$).[2] Normalizing as in Melitz (2003) the wage rate, w, to unity, the cost function is:

$$c(q) = \frac{q}{\varphi} + f + [M(\varphi^*)]^{-\eta}. \tag{4}$$

It is important to note that fixed costs are still exogenous to an individual firm since M is a negative function of the industry ZPC productivity φ^* and a positive function of L.[3]

Given the firm's cost function, profit maximization yields the same markup pricing equation as in Melitz (2003):

$$p(\varphi) = \frac{1}{\rho\varphi} \tag{5}$$

where $\rho = (\sigma - 1)/\sigma$.

[2] The shape parameter in the Pareto distribution, γ, will be introduced later.

[3] We will provide solutions for the steady-state M, P, and other aggregate variables later in the more general case in Online Appendix 2.

Profit for firm φ is:

$$\pi(\varphi) = r(\varphi) - c(\varphi) = \frac{r(\varphi)}{\sigma} - f - [M(\varphi^*)]^{-\eta} \tag{6}$$

where $r(\varphi)$ is firm revenue and $\frac{r(\varphi)}{\sigma}$ is variable profit. Consequently, given equations (2) and (3), $r(\varphi)$ and $\pi(\varphi)$ also depend on aggregate price and revenue. We also note in general that:

$$\frac{r(\varphi_1)}{r(\varphi_2)} = \left(\frac{\varphi_1}{\varphi_2}\right)^{\sigma-1}. \tag{7}$$

Following section 3 in Melitz (2003), aggregate productivity level $\tilde{\varphi}$ is a function of the ZPC productivity φ^*:

$$\tilde{\varphi} = \left[\frac{1}{1 - G(\varphi^*)} \int_{\varphi^*}^{\infty} \varphi^{\sigma-1} g(\varphi) d\varphi\right]^{\frac{1}{\sigma-1}} \tag{8}$$

where $g(\varphi)$ is the probability density function of the productivity distribution and $1 - G(\varphi^*)$ is the *ex ante* probability of successful entry. Given equation (7), we can write:

$$\frac{r(\tilde{\varphi})}{r(\varphi^*)} = \left(\frac{\tilde{\varphi}(\varphi^*)}{\varphi^*}\right)^{\sigma-1}. \tag{9}$$

We define average profits as $\bar{\pi}$ and applying above we find:

$$\bar{\pi} = \pi(\tilde{\varphi}) = \frac{r(\tilde{\varphi})}{\sigma} - f - \left[M(\varphi^*)\right]^{-\eta}. \tag{10}$$

Using equation (9):

$$\bar{\pi}(\varphi^*) = \left(\frac{\tilde{\varphi}(\varphi^*)}{\varphi^*}\right)^{\sigma-1} \frac{r(\varphi^*)}{\sigma} - f - \left[M(\varphi^*)\right]^{-\eta}. \tag{11}$$

Since $\pi(\varphi^*) = 0$, then $\frac{r(\varphi *)}{\sigma} = f + [M(\varphi *)]^{-\eta}$. Substituting $f + [M(\varphi *)]^{-\eta}$ for $\frac{r(\varphi *)}{\sigma}$ in equation (11) yields:

$$\bar{\pi}(\varphi^*) = \left[\left(\frac{\tilde{\varphi}(\varphi^*)}{\varphi^*}\right)^{\sigma-1} - 1\right]\left(f + \left[M(\varphi^*)\right]^{-\eta}\right) \tag{12}$$

which is the analogous ZPC condition in our model to equation (10) in Melitz (2003).

The value of firms and free-entry considerations are identical to Melitz (2003). Hence, the free-entry (FE) condition is identical to equation (11) in Melitz (2003):

$$\bar{\pi}(\varphi^*) = \frac{\delta f^e}{1 - G(\varphi^*)} \tag{13}$$

where δ is the constant probability in every period of a bad shock that forces a firm to exit the industry and f^e is the exogenous fixed entry cost ($f^e > 0$).

The novel and complicating aspect of our model is that, while $\left(\frac{\tilde{\varphi}(\varphi^*)}{\varphi^*}\right)^{\sigma-1} - 1$ is a negative function of φ^* as in Melitz (2003), $f + \left[M(\varphi^*)\right]^{-\eta}$ is a *positive* function of φ^*. However, as long as fixed costs decline sufficiently slowly in the number of exporters (the identical condition for an interior solution as in Krautheim (2012)) and that f is positive, the solutions for φ^* and $\bar{\pi}$ exist and are unique, as in Melitz (2003), Appendix B.[4] We now prove this.

Proof:

The following is a proof that the ZPC condition in equation (12) and the FE condition in equation (13) in the paper identify a unique cutoff φ^* and that the ZPC curve cuts the FE curve from above in $(\varphi,\ \pi)$ space. We do this by showing that

$$[1 - G(\varphi)] \left[\left(\frac{\widetilde{\varphi}(\varphi)}{\varphi} \right)^{\sigma-1} - 1 \right] \left[f + [M(\varphi)]^{-\eta} \right]$$

is monotonically decreasing from infinity to zero on $(0, \infty)$. As in Melitz (2003), define:

$$k(\varphi) = \left[\left(\frac{\widetilde{\varphi}(\varphi)}{\varphi} \right)^{\sigma-1} - 1 \right] > 0 \quad .$$

It will be convenient to specify an explicit function for $[M(\varphi)]^{-\eta}$. Assuming an untruncated Pareto distribution with shape parameter γ, we conjecture $[M(\varphi)]^{-\eta} = [\alpha L \varphi^{-\gamma}]^{-\eta}$, where $\alpha = (\sigma - 1)/\gamma\sigma f^e$.[5] We will show in Online Appendix 2 that this conjecture is true.

We define:

$$\begin{aligned} l(\varphi) = & \left[\left(\frac{\widetilde{\varphi}(\varphi)}{\varphi} \right) - 1 \right] \left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^\eta} \right] \\ = & [k(\varphi)] \left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^\eta} \right] \quad . \end{aligned}$$

We define:

$$h(\varphi) = [1 - G(\varphi)] l(\varphi) \quad .$$

Given the definition of $l(\varphi)$:

$$l'(\varphi) = \left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^\eta} \right] \left[\frac{k(\varphi) g(\varphi)}{1 - G(\varphi)} - \frac{(\sigma - 1)[k(\varphi) + 1]}{\varphi} \right] + k(\varphi) \left[\frac{\gamma\eta}{(\alpha L)^\eta} \varphi^{\gamma\eta - 1} \right]$$

[4] Specifically, a sufficient condition for existence and uniqueness, in the case of the untruncated Pareto distribution with heterogeneity parameter γ, is $[\gamma/(\sigma - 1)]\eta < 1$, analogous to Krautheim (2012). It will turn out that this is also a sufficient condition for existence and uniqueness in the more general model to follow. In a steady-state equilibrium the aggregate variables must remain constant; we will solve for these in the more general case in Online Appendix 2.

[5] Assume $\varphi_{min} = 1$.

using Melitz (2003), Appendix B.

Given the definition of $h(\varphi)$ above:

$$
\begin{aligned}
h'(\varphi) &= l(\varphi)\frac{\partial[1-G(\varphi)]}{\partial\varphi} + [1-G(\varphi)]l'(\varphi) \\
h'(\varphi) &= -k(\varphi)\left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}\right] g(\varphi) + [1-G(\varphi)]\left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}\right]\frac{k(\varphi)g(\varphi)}{1-G(\varphi)} \\
&\quad - [1-G(\varphi)]\left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}\right]\frac{(\sigma-1)[k(\varphi)+1]}{\varphi} \\
&\quad + [1-G(\varphi)]k(\varphi)\left[\frac{\gamma\eta}{(\alpha L)^{\eta}}\varphi^{\gamma\eta-1}\right] \\
h'(\varphi) &= -[1-G(\varphi)]\left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}\right]\frac{(\sigma-1)}{\varphi}[k(\varphi)+1] \\
&\quad + [1-G(\varphi)]k(\varphi)\left[\frac{\gamma\eta}{(\alpha L)^{\eta}}\varphi^{\gamma\eta-1}\right]
\end{aligned}
$$

We now show the necessary condition for the elasticity for $h(\varphi)$ with respect to φ to be negative and bounded away from zero, recalling that $h(\varphi)$ is nonnegative:

$$
\begin{aligned}
\frac{\varphi h'(\varphi)}{h(\varphi)} &= -\frac{[1-G(\varphi)]\left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}\right](\sigma-1)[k(\varphi)+1]}{[1-G(\varphi)]k(\varphi)\left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}\right]} \\
&\quad + \frac{[1-G(\varphi)]k(\varphi)\left[\frac{\gamma\eta}{(\alpha L)^{\eta}} + \varphi^{\gamma\eta}\right]}{[1-G(\varphi)]k(\varphi)\left[f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}\right]} \\
\frac{\varphi h'(\varphi)}{h(\varphi)} &= -(\sigma-1)\frac{[k(\varphi)+1]}{k(\varphi)} + \gamma\eta\left[\frac{\frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}}{f + \frac{\varphi^{\gamma\eta}}{(\alpha L)^{\eta}}}\right] \\
\frac{\varphi h'(\varphi)}{h(\varphi)} &= -(\sigma-1)\left(1 + \frac{1}{k(\varphi)}\right) + \gamma\eta s(\varphi)
\end{aligned}
$$

where

$$
s = \frac{[M(\varphi)]^{-\eta}}{f + [M(\varphi)]^{-\eta}} < 1.
$$

As in Melitz (2003), Appendix B, the first RHS term is negative since it is less than $-(\sigma-1)$, which is negative since we assume $\sigma > 1$ as standard and we know $k(\varphi)$ is positive. To ensure that $[\varphi h'(\varphi)]/h(\varphi)$ is negative, then a unique and stable equilibrium is guaranteed if:

$$
\frac{\gamma}{\sigma-1}\eta s(\varphi) < 1 + \frac{1}{k(\varphi)}. \tag{14}
$$

A sufficient condition for existence and uniqueness is:

$$\frac{\gamma\eta}{\sigma - 1} < 1. \tag{15}$$

The rationale lies in taking the limits for equation (14) as φ^* goes to zero and infinity. As φ^* approaches 0, the LHS of equation (14) goes to 0 (as s goes to 0) and the RHS of equation (14) goes to 1. As φ^* approaches ∞, the LHS approaches $\frac{\gamma\eta}{\sigma-1}$ (as s approaches 1) and the RHS approaches ∞. Hence, a sufficient condition for existence and uniqueness of a stable equilibrium is $\frac{\gamma\eta}{\sigma-1} < 1$. It will turn out in the general model in Online Appendix 2 that equation (15) is the same sufficient condition.

Finally, an extension to the case with domestic firms and exporters is straightforward. In the absence of endogenous fixed costs, appropriate restrictions on values of τ, f_d, and f_x under:

$$\varphi_x^* = \tau \left(\frac{f_x}{f_d}\right)^{\frac{1}{\sigma-1}} \varphi_d^*$$

guarantees selection into exports with $\varphi_x^* > \varphi_d^*$. In the presence of endogenous and exogenous fixed costs, appropriate restrictions on values of τ, f_d, and f_x under:

$$\varphi_x^* = \tau \left[\frac{f_x + (\varphi_x^*)^{\gamma\eta}}{f_d + (\varphi_d^*)^{\gamma\eta}}\right]^{\frac{1}{\sigma-1}} \varphi_d^*$$

guarantees selection into exports with $\varphi_x^* > \varphi_d^*$.

Online Appendix 2: N-Country Open-Economy Melitz Model with Exogenous and Endogenous Fixed Costs

Extending Redding (2011), Melitz and Redding (2014), and Online Appendix 1, we provide solutions for a more general model with additively separable exogenous and endogenous fixed (market-entry) costs, in the context of a Melitz model with free entry and exit and labor-market clearing.

A2.1: Consumer Behavior

Consumer preferences are defined over a continuum of differentiated varieties Ω_j in a single monopolistically competitive industry, taking the form:

$$U_j = \left(\int_{\omega \in \Omega_j} q(\omega)^{\frac{\sigma-1}{\sigma}} d\omega \right)^{\frac{\sigma}{\sigma-1}} \tag{1}$$

where $q(\omega)$ is the quantity of product ω consumed of available varieties Ω_j. The elasticity of substitution across varieties is σ, where $\sigma > 1$ by assumption. Maximizing utility subject to a standard income constraint:

$$w_j L_j + T_j = \int_{\omega \in \Omega_j} p(\omega) q(\omega) d\omega$$

where w_j is the wage rate in country j, L_j is the labor force (population), T_j is tariff revenue rebated back to households, and $p(\omega)$ is the price paid for variety ω yields a demand function in country j for country i's variety:

$$q_{ij}(\omega) = \left(\frac{p_{ij}(\omega)}{P_j} \right)^{-\sigma} \left(\frac{E_j}{P_j} \right) \tag{2}$$

where aggregate expenditures, E_j, equals labor income plus tariff-revenue income, $w_j L_j + T_j$, and P_j is the ideal price index of the form:

$$P_j = \left[\int_{\omega \in \Omega_j} p(\omega)^{1-\sigma} d\omega \right]^{\frac{1}{1-\sigma}}. \tag{3}$$

A2.2: Production

We follow Redding (2011, Web Appendix) and Melitz and Redding (2014) closely. Consider a world with N countries. There is a competitive fringe of potential entrants that can enter a market in country i by paying a (exogenous) sunk cost of f_i^e units of labor. Potential entrants face uncertainty about their productivity draw. Once the sunk entry cost is paid, a firm draws a productivity level φ from a distribution $G(\varphi)$.[6]

Firms in the single industry in country i produce a differentiated variety ω at a cost, $c(q_{ij})$, with heterogenous productivity under monopolistic competition. Production of a variety for any market j ($j = 1, ..., N$) entails a fixed cost, f_{ij}. In our model, the cost of sending $q_{ij}(\omega)$ goods to destination market j is given by:

$$c(q_{ij}) = \frac{w_i q_{ij} \tau_{ij}}{\varphi} + w_j\big(A_{ij} + M_{ij}^{-\eta}\big) \tag{4}$$

where, for simplicity, we define for now $A_{ij} = A_{ij}^P + A_{ij}^N$ and recall $\tau_{ij} = t_{ij} + fr_{ij}$, as discussed in the paper. Hence $f_{ij} = A_{ij} + M_{ij}^{-\eta}$, and the remaining variables in (4) are defined in the paper. A_{ij}^P (A_{ij}^N) is exogenous policy (non-policy) fixed costs. As in Arkolakis, Klenow, Demidova, and Rodriguez-Clare (2008), Redding (2011), and Melitz and Redding (2014), we assume that the fixed costs are incurred at the destination market and are denominated in terms of the destination wage rate (w_j). As in Redding (2011) and Melitz and Redding (2014), we treat the home market and foreign markets in a similar manner.

As is standard in these models, profit maximization can be done separately by market yielding that the price of goods sold in market j by firms from country i with productivity φ is:

$$p_{ij}(\varphi) = \frac{w_i \tau_{ij}}{\rho \varphi} \tag{5}$$

where $\rho = \frac{\sigma - 1}{\sigma}$ and $\tau_{ii} = 1$.

A2.3: Equilibrium Conditions

Zero-Profits-Cutoff (ZPC) Conditions

Profits from selling goods in market j ($j = 1, ..., N$) by firms from country i with productivity φ are given by:

$$\pi_{ij}(\varphi) = \left(\frac{w_i \tau_{ij}}{\rho P_j \varphi}\right)^{1-\sigma} \frac{E_j}{\sigma} - w_j\big(A_{ij} + M_{ij}^{-\eta}\big) \tag{6}$$

where, as standard, the first term on the right-hand-side (RHS) is variable profits and the second RHS term is fixed costs. As standard, we define the zero-profit-cutoff (ZPC) productivity, φ_{ij}^*, as the productivity draw where a firm would earn zero profits from selling in

[6] In the dynamic case, the productivity level of each firm remains fixed after entry, but firms face an exogenous probability of death that creates a steady state of entry and exit of firms. However, as in Redding (2011), we consider here the static case.

market j:

$$\pi_{ij}(\varphi^*_{ij}) = \left(\frac{w_i \tau_{ij}}{\rho \varphi^*_{ij} P_j}\right)^{1-\sigma} \frac{E_j}{\sigma} - w_j\big(A_{ij} + M_{ij}^{-\eta}\big) = 0 \quad . \tag{7}$$

The unique element differentiating our model from that in Redding (2011) and Melitz and Redding (2014) is that, in equilibrium, fixed costs are a function of φ^*_{ij} because M_{ij} is a function of φ^*_{ij}, i.e., $M_{ij} = M_{ij}(\varphi^*_{ij})$. To establish a finite, stable, and unique ZPC productivity for firms in country i selling to market j, we *conjecture* that the equilibrium mass of firms that sells goods from i to j can be expressed as:

$$M_{ij} = \alpha_i L_i (\varphi^*_{ij})^{-\gamma} \tag{8}$$

where α_i will be determined later, L_i is exogenous labor in country i, and γ is the shape parameter from the Pareto distribution, $G(\varphi) = 1 - \varphi^{-\gamma}$, which we assume is the distribution for productivities.[7] We will prove this conjecture is correct later. Hence, the ZPC productivity level is the *implicit* solution to the following equation:

$$\left(\frac{w_i \tau_{ij}}{\rho P_j}\right)^{1-\sigma} \frac{E_j}{\sigma} (\varphi^*_{ij})^{\sigma-1} = w_j\big[A_{ij} + (\alpha_i L_i)^{-\eta} (\varphi^*_{ij})^{\eta\gamma}\big] \tag{9}$$

where we note that P_j is also a function of φ^*_{ij} and w_i will be determined later using multilateral trade-balance conditions. Note the similarity between equation (9) above and equation (35) in the Web Appendix to Redding (2011). As in Redding (2011), we require restrictions on parameter values to ensure selection into export markets and hence $\phi^*_{ii} < \phi^*_{ij}$ for all $j \neq i$; see Online Appendix 1 for the two-country case restriction. Although we cannot solve explicitly for ϕ^*_{ij}, we can show the conditions for existence of a finite, unique, and stable cutoff productivity for sales from country i to country j using a fixed-point argument, similar to that in Redding (2011). We start with the zero-profit condition equation (9), defining variable profits R_{ij} as:

$$R_{ij} = \left(\frac{w_i \tau_{ij}}{\rho P_j}\right)^{1-\sigma} \frac{E_j}{\sigma} (\varphi^*_{ij})^{\sigma-1} \tag{10}$$

and fixed costs C_{ij} as:

$$C_{ij} = w_j\left[A_{ij} + (\alpha_i L_i)^{-\eta} \big((\varphi^*_{ij})^{\sigma-1}\big)^{\frac{\gamma\eta}{\sigma-1}}\right] \tag{11}$$

Since $A_{ij} > 0$, there exists a stable cut-off productivity if $\partial C_{ij}/\partial(\varphi^*_{ij})^{\sigma-1} < \partial R_{ij}/\partial(\varphi^*_{ij})^{\sigma-1}$ when $C_{ij} = R_{ij}$. This implies:

$$w_j \frac{\gamma\eta}{(\sigma-1)} (\alpha_i L_i)^{-\eta} \left[(\varphi^*_{ij})^{\sigma-1}\right]^{\frac{\gamma\eta}{\sigma-1}} (\varphi^*_{ij})^{1-\sigma} < \left(\frac{w_i \tau_{ij}}{\rho P_j}\right)^{1-\sigma} \frac{E_j}{\sigma} + (\varphi^*_{ij})^{\sigma-1} \left(\frac{w_i \tau_{ij}}{\rho}\right)^{1-\sigma} \frac{E_j}{\sigma} \frac{\partial P_j^{\sigma-1}}{\partial(\varphi^*_{ij})^{\sigma-1}} \tag{12}$$

[7]We assume $\varphi_{min} = 1$. The probability density function is $g(\varphi) = \gamma\varphi^{-(\gamma+1)}$.

Solving for $\partial P_j^{\sigma-1}/\partial(\varphi_{ij}^*)^{\sigma-1}$ yields:

$$\frac{\partial P_j^{\sigma-1}}{\partial(\varphi_{ij}^*)^{\sigma-1}} = (-1)(P_j^{\sigma-1})^{-2}(-1)\left(\frac{\gamma}{\sigma-1}-1\right)\alpha_i L_i\left(\frac{\gamma}{\gamma-(\sigma-1)}\right)\left(\frac{\sigma}{\sigma-1}w_i\tau_{ij}\right)^{1-\sigma}(\varphi_{ij}^*)^{-\gamma} \tag{13}$$

or

$$\frac{\partial P_j^{\sigma-1}}{\partial(\varphi_{ij}^*)^{\sigma-1}} = (P_j^{\sigma-1})^{-2}\left(\frac{\gamma}{\sigma-1}-1\right)\left(\frac{\gamma}{\gamma-(\sigma-1)}\right)\alpha_i L_i\left(\frac{\sigma}{\sigma-1}w_i\tau_{ij}\right)^{1-\sigma}(\varphi_{ij}^*)^{-\gamma} \tag{14}$$

Substituting equation (14) for $\frac{\partial P_j^{\sigma-1}}{\partial(\varphi_{ij}^*)^{\sigma-1}}$ in the RHS of equation (12) yields:

$$\begin{aligned} & w_j\frac{\gamma\eta}{(\sigma-1)}(\alpha_i L_i)^{-\eta}\left[(\varphi_{ij}^*)^{\sigma-1}\right]^{\frac{\gamma\eta}{\sigma-1}}(\varphi_{ij}^*)^{1-\sigma} \\ & < \left(\frac{w_i\tau_{ij}}{\rho P_j}\right)^{1-\sigma}\frac{E_j}{\sigma} + \left(\frac{w_i\tau_{ij}}{\rho P_j}\right)^{1-\sigma}\frac{E_j}{\sigma}(\varphi_{ij}^*)^{\sigma-1}\frac{\left(\frac{\gamma}{\sigma-1}-1\right)\alpha_i L_i\left(\frac{\gamma}{\gamma-(\sigma-1)}\right)\left(\frac{\sigma}{\sigma-1}w_i\tau_{ij}\right)^{1-\sigma}(\varphi_{ij}^*)^{-\gamma}}{\sum_i \alpha_i L_i(\varphi_{ij}^*)^{-\gamma+(\sigma-1)}\left(\frac{\gamma}{\gamma-(\sigma-1)}\right)\left(\frac{\sigma}{\sigma-1}w_i\tau_{ij}\right)^{1-\sigma}} \end{aligned} \tag{15}$$

or

$$w_j\frac{\gamma\eta}{(\sigma-1)}(\alpha_i L_i)^{-\eta}\left[(\varphi_{ij}^*)^{\sigma-1}\right]^{\frac{\gamma\eta}{\sigma-1}}(\varphi_{ij}^*)^{1-\sigma} < \left(\frac{w_i\tau_{ij}}{\rho P_j}\right)^{1-\sigma}\frac{E_j}{\sigma}\left[1+\left(\frac{\gamma}{\sigma-1}-1\right)\theta_{ij}\right] \tag{16}$$

where

$$\theta_{ij} = \frac{[1-G(\varphi_{ij}^*)]\alpha_i L_i\left(\frac{w_i\tau_{ij}}{\varphi_{ij}^*}\right)^{1-\sigma}}{\sum_i [1-G(\varphi_{ij}^*)]\alpha_i L_i\left(\frac{w_i\tau_{ij}}{\varphi_{ij}^*}\right)^{1-\sigma}}$$

where $[1-G(\varphi_{ij}^*)] = (\varphi_{ij}^*)^{-\gamma}$ for the Pareto distribution. Hence, $\theta_{ij} < 1$ reflects the relative importance of j's imports from i in j's total imports.

Since the condition above is evaluated at $R_{ij} = C_{ij}$, we can substitute $(\theta_{ij}^*)^{1-\sigma}w_j[A_{ij} + (\alpha_i L_i)^{-\eta}[(\varphi_{ij}^*)^{\sigma-1}]^{\frac{\gamma\eta}{\sigma-1}}]$ for $(w_i\tau_{ij}/\rho P_j)^{1-\sigma}(E_j/\sigma)$ in equation (16) to yield:

$$\begin{aligned} & \left(\frac{\gamma\eta}{\sigma-1}\right)(\alpha_i L_i)^{-\eta}\left[(\varphi_{ij}^*)^{\sigma-1}\right]^{\frac{\gamma\eta}{\sigma-1}}(\varphi_{ij}^*)^{1-\sigma} \\ & < (\varphi_{ij}^*)^{1-\sigma}\left[A_{ij} + (\alpha_i L_i)^{-\eta}[(\varphi_{ij}^*)^{\sigma-1}]^{\frac{\gamma\eta}{\sigma-1}}\right]\left[1+\left(\frac{\gamma}{\sigma-1}-1\right)\theta_{ij}\right] \end{aligned} \tag{17}$$

The above equation simplifies to:

$$\left(\frac{\gamma\eta}{\sigma-1}\right)s_{ij}(\varphi_{ij}^*)\left(\frac{1}{1+\left(\frac{\gamma}{\sigma-1}-1\right)\theta_{ij}(\varphi_{ij}^*)}\right) < 1 \tag{18}$$

where

$$s_{ij} = \frac{M_{ij}^{-\eta}}{A_{ij} + M_{ij}^{-\eta}} = \frac{(\alpha_i L_i)^{-\eta}[(\varphi_{ij}^*)^{-\gamma}]^{-\eta}}{A_{ij} + (\alpha_i L_i)^{-\eta}[(\varphi_{ij}^*)^{-\gamma}]^{-\eta}}$$

Hence, s_{ij} is the share of endogenous export fixed costs in total export fixed costs for i in j. Equation (18) is the stability condition. It ensures that there exists finite φ_{ij}^* that satisfy the N^2 ZPC conditions, where N is the number of countries.

The similarity to the stability condition in Online Appendix 1 is apparent. The LHS of equation (18) is bounded above by $\frac{\gamma\eta}{\sigma-1}$ and below by 0 as φ^* approaches its limiting values, as in the previous appendix. Clearly, as before, a sufficient condition for existence of a unique zero-profit cutoff productivity is $\frac{\gamma\eta}{\sigma-1} < 1$, which was assumed in Krautheim (2012).[8]

Average Profits and Free-Entry Conditions

Assuming no time discounting and a static setting as in Redding (2011), the value of a firm with productivity ϕ is:

$$v = max\Big[0, \pi(\varphi)\Big] \tag{19}$$

The free-entry (FE) condition requires that the expected value of entry to a firm in country i (v_i^E) equals sunk entry costs ($w_i f_i^e$):

$$v_i^E = [1 - G(\varphi_{ii}^*)]\bar{\pi}_i = w_i f_i^e \tag{20}$$

where φ_{ii}^* is the domestic cutoff productivity, $[1 - G(\varphi_{ii}^*)]$ is the probability of successful entry in the domestic market, and $\bar{\pi}_i$ is average profits.

It will be useful first to solve for average profits of firms in i producing and selling to any market j ($\bar{\pi}_{ij}$):

$$\bar{\pi}_{ij} = \int_{\varphi_{ij}^*}^{\infty} \frac{p_{ij}q_{ij}}{\sigma} \frac{g(\varphi)}{1 - G(\varphi_{ij}^*)} d\varphi - \int_{\varphi_{ij}^*}^{\infty} w_j \left[A_{ij} + \left(M_{ij}(\varphi_{ij}^*)\right)^{-\eta}\right] \frac{g(\varphi)}{1 - G(\varphi_{ij}^*)} d\varphi$$

[8] In principle, fr_{ij} is endogenous because $fr_{ij} = freight_{ij}/p_{ij}(\varphi)$ and p_{ij} is endogenous. We have also worked through the model to account for endogeneity of p_{ij} in fr_{ij}, treating $freight_{ij}$ as exogenous. An analogous stability condition surfaces, $\left(\frac{\gamma\eta}{\sigma-1}\right) s_{ij}(\varphi_{ij}^*) \left(\frac{w_i/\varphi_{ij}^*}{w_i/\varphi_{ij}^* + freight_{ij}} + \left(\frac{\gamma}{\sigma-1} - 1\right) \tilde{\theta}_{ij}(\varphi_{ij}^*)\right)^{-1} < 1$, where $\tilde{\theta}_{ij}$ is analogous to θ_{ij} and the condition accounts for the ratio of $freight_{ij}$ to marginal production costs (w_i/φ_{ij}^*). When freight costs are a small share of marginal costs and $\tilde{\theta}_{ij}$ is small, the condition is the same as in the paper. For derivations, see the Theoretical Supplement to Online Appendix 2, which follows Online Appendix 8.

Substituting in the Pareto pdf and cdf and other appropriate substitutions for $p(\varphi_{ij})$ and $q(\varphi_{ij})$ yields:

$$\bar{\pi}_{ij} = \int_{\varphi^*_{ij}}^{\infty} \left(\frac{w_i \tau_{ij}}{\rho P_j}\right)^{1-\sigma} \frac{E_j}{\sigma} \gamma \varphi^{-(\gamma-\sigma+2)} (\varphi^*_{ij})^{\gamma} d\varphi$$
$$- \int_{\varphi^*_{ij}}^{\infty} \gamma w_j \big(A_{ij} + M_{ij}^{-\eta}\big) \varphi^{-(\gamma+1)} (\varphi^*_{ij})^{\gamma} d\varphi$$

After integrating this equation and using equation (7), the above expression can be simplified to:

$$\bar{\pi}_{ij} = \left(\frac{\sigma - 1}{\gamma - \sigma + 1}\right) w_j \big(A_{ij} + M_{ij}^{-\eta}\big) \quad . \tag{21}$$

Since $1 - G(\varphi^*_{ij}) = (1/\varphi^*_{ij})^{\gamma}$, expected profits from selling in market j for all active firms in i is then:

$$[1 - G(\varphi^*_{ij})]\bar{\pi}_{ij} = \left\{ w_j \big(A_{ij} + M_{ij}^{-\eta}\big) \left(\frac{\sigma - 1}{\gamma - \sigma + 1}\right) \right\} \left(\frac{1}{\varphi^*_{ij}}\right)^{\gamma}$$

Summing over all destination markets $j = 1, ..., N$ yields expected profits for active firms in country i:

$$[1 - G(\varphi^*_{ii})]\bar{\pi}_i = \sum_j [1 - G(\varphi^*_{ij})]\bar{\pi}_{ij} = \sum_j \left\{ w_j \big(A_{ij} + M_{ij}^{-\eta}\big) \left(\frac{\sigma - 1}{\gamma - \sigma + 1}\right) \right\} \left(\frac{1}{\varphi^*_{ij}}\right)^{\gamma} \tag{22}$$

In equilibrium, the expected value of entry equals the fixed cost of entry. The free-entry condition for any country i is then given by:

$$[1 - G(\varphi^*_{ii})]\bar{\pi}_i = \sum_j [1 - G(\varphi^*_{ij})]\bar{\pi}_{ij} =$$

$$\left(\frac{\sigma - 1}{\gamma - \sigma + 1}\right) \sum_j \left\{ w_j \big(A_{ij} + M_{ij}^{-\eta}\big) \right\} \left(\frac{1}{\varphi^*_{ij}}\right)^{\gamma} = w_i f_i^e$$

or after rearranging:

$$\bar{\pi}_i = \left(\frac{\sigma - 1}{\gamma - \sigma + 1}\right) \sum_j w_j \big(A_{ij} + M_{ij}^{-\eta}\big) \left(\frac{\varphi^*_{ii}}{\varphi^*_{ij}}\right)^{\gamma} = w_i f_i^e (\varphi^*_{ii})^{\gamma} \quad . \tag{23}$$

Note the parallel between our equation (23) and equation (36) in Redding (2011) or equation (8) in Melitz and Redding (2014). We now have N free-entry conditions and the N^2 ZPC conditions. Next we solve for the N endogenous $P_i^{1-\sigma}$, N^2 endogenous M_{ij}, N^2 endogenous trade flows, and N endogenous w_i.

Price Index and Mass of Firms

In order to find the equilibrium masses of firms, we follow a strategy employed in Redding (2011). In particular, we use the price index, the free-entry condition, and the labor-market-clearing condition to solve for the equilibrium masses of firms.

We know from Redding (2011) that the price index for country i can be expressed as:

$$P_i^{1-\sigma} = \sum_j M_j \left(\frac{1 - G(\varphi_{ji}^*)}{1 - G(\varphi_{jj}^*)} \right) \int_{\varphi_{ji}^*}^{\infty} p_{ji}(\varphi)^{1-\sigma} \frac{g(\varphi)}{1 - G(\varphi_{ji}^*)} d\varphi \tag{24}$$

where $M_j \left(\frac{1-G(\varphi_{ji}^*)}{1-G(\varphi_{jj}^*)} \right) = M_{ji}$. Substituting in using the Pareto distribution yields:

$$P_i^{1-\sigma} = \sum_j M_j \left(\frac{\varphi_{jj}^*}{\varphi_{ji}^*} \right)^{\gamma} \int_{\varphi_{ji}^*}^{\infty} \left(\frac{w_j \tau_{ji}}{\rho \varphi} \right)^{1-\sigma} \gamma \varphi^{-(\gamma+1)} (\varphi_{ji}^*)^{\gamma} d\varphi \tag{25}$$

Integrating yields:

$$P_i^{1-\sigma} = \sum_j M_j \left(\frac{\varphi_{jj}^*}{\varphi_{ji}^*} \right)^{\gamma} (\varphi_{ji}^*)^{\sigma-1} \left(\frac{\gamma}{\gamma - \sigma + 1} \right) \left(\frac{\sigma}{\sigma - 1} w_j \tau_{ji} \right)^{1-\sigma} \tag{26}$$

Using ZPC condition (7) from above:

$$(\varphi_{ji}^*)^{\sigma-1} = \frac{w_i \big(A_{ji} + M_{ji}^{-\eta} \big)}{\left(\frac{w_j \tau_{ji}}{\rho P_i} \right)^{1-\sigma} \frac{E_i}{\sigma}} \quad . \tag{27}$$

Substituting equation (27) for $(\varphi_{ij}^*)^{\sigma-1}$ into equation (26) yields:

$$P_i^{1-\sigma} = \sum_j M_j \left(\frac{\varphi_{jj}^*}{\varphi_{ji}^*} \right)^{\gamma} \big(A_{ji} + M_{ji}^{-\eta} \big) \left(\frac{\gamma \sigma}{\gamma - \sigma + 1} \right) P_i^{1-\sigma} \left(\frac{w_i}{w_i L_i + T_i} \right) \tag{28}$$

Dividing through by $P_i^{1-\sigma}$ and dividing through by $\left(\frac{\gamma\sigma}{\gamma-\sigma+1} \right) \frac{w_i}{w_i L_i + T_i}$ yields:

$$\left(\frac{\gamma - \sigma + 1}{\gamma \sigma} \right) L_i \left(1 + \frac{T_i}{w_i L_i} \right) = \sum_j M_j \left(\frac{\varphi_{jj}^*}{\varphi_{ji}^*} \right)^{\gamma} \big(A_{ji} + M_{ji}^{-\eta} \big) \tag{29}$$

We now use the labor-market-clearing condition to solve for the M_i. Labor in country i is employed in the production in i of goods for the home and foreign markets, in the entry costs in i, and in fixed costs to produce at home and for foreign firms to export to market i:

$$L_i = M_i \sum_j \int_{\varphi_{ij}^*}^{\infty} l_{ij}^{var} \left(\frac{1 - G(\varphi_{ij}^*)}{1 - G(\varphi_{ii}^*)} \right) \frac{g(\varphi)}{1 - G(\varphi_{ij}^*)} d\varphi$$

$$+ M_i\left(\frac{f_i^e}{1-G(\varphi_{ii}^*)}\right) + \sum_j M_j \frac{1-G(\varphi_{ji}^*)}{1-G(\varphi_{jj}^*)}\left[A_{ji} + \left(M_{ji}(\varphi_{ji}^*)\right)^{-\eta}\right] \tag{30}$$

where l_{ij}^{var} denotes variable labor input and so:

$$l_{ij}^{var}(\varphi) = \left(\frac{\sigma}{\sigma-1}\frac{w_i\tau_{ij}}{\varphi}\right)^{-\sigma}\frac{E_j}{P_j^{1-\sigma}}\frac{\tau_{ij}}{\varphi} \tag{31}$$

Substituting the equation above into only the first term on the RHS of equation (30), using the Pareto distribution, the ZPC condition (7), and integrating yields:

$$M_i \sum_j \int_{\varphi_{ij}^*}^{\infty} l_{ij}^{var}\left(\frac{1-G(\varphi_{ij}^*)}{1-G(\varphi_{ii}^*)}\right)\frac{g(\varphi)}{1-G(\varphi_{ij}^*)}d\varphi$$

$$= M_i\left[\sum_j (\sigma-1)\frac{w_j}{w_i}\left[A_{ij} + \left(M_{ij}(\varphi_{ij}^*)\right)^{-\eta}\right]\left(\frac{\varphi_{ii}^*}{\varphi_{ij}^*}\right)^{\gamma}\frac{\gamma}{\gamma-\sigma+1}\right]$$

Using free-entry condition (23), the RHS term above simplifies to:

$$\gamma M_i f_i^e(\varphi_{ii}^*)^{\gamma}.$$

Substituting the term above along with equation (29) into equation (30) and using the Pareto distribution yields:

$$L_i = \gamma M_i f_i^e(\varphi_{ii}^*)^{\gamma} + M_i f_i^e(\varphi_{ii}^*)^{\gamma} + \left(\frac{\gamma-\sigma+1}{\gamma\sigma}\right)L_i\left(1 + \frac{T_i}{w_iL_i+T_i}\right). \tag{32}$$

Solving for M_i yields:

$$M_i(\gamma+1)f_i^e(\varphi_{ii}^*)^{\gamma} = L_i - \left(\frac{\gamma-\sigma+1}{\gamma\sigma}\right)\left(1+\frac{T_i}{w_iL_i+T_i}\right)L_i \tag{33}$$

which simplifies to:

$$M_i = L_i\left(\frac{\sigma-1}{\gamma\sigma}\right)(f_i^e)^{-1}(\varphi_{ii}^*)^{-\gamma}\left[1 - \frac{\frac{\gamma}{\sigma-1}-1}{1+\gamma}\frac{T_i}{w_iL_i}\right] \tag{34}$$

or:

$$M_i = \alpha_i L_i(\varphi_{ii}^*)^{-\gamma} \tag{35}$$

where:

$$\alpha_i = \frac{\sigma-1}{\gamma\sigma f_i^e}\left[1 - \frac{\frac{\gamma}{\sigma-1}-1}{1+\gamma}\frac{T_i}{w_iL_i}\right] \tag{36}$$

Since $M_{ij} = \left(\frac{1-G(\varphi_{ij}^*)}{1-G(\varphi_{ii}^*)}\right)M_i$, then:

$$M_{ij} = \alpha_i L_i(\varphi_{ij}^*)^{-\gamma} \tag{37}$$

as originally conjectured.

A2.4: Gravity Equation for Trade Flows

Following Redding (2011), the trade flow from country i to country j can be expressed in terms of an extensive margin and an average exports (conditional upon exporting) margin:

$$X_{ij} = \underbrace{\left[\frac{1 - G(\varphi_{ij}^*)}{1 - G(\varphi_{ii}^*)}\right] M_i}_{\text{Extensive}} \int_{\varphi_{ij}^*}^{\infty} \left(\frac{w_i \tau_{ij}}{\rho \varphi P_j}\right)^{1-\sigma} E_j \frac{g(\varphi)}{1 - G(\varphi_{ij}^*)} d\varphi \tag{38}$$

Using the Pareto distribution $g(\varphi) = \gamma \varphi^{-(\gamma+1)}$, $1-G(\varphi_{ij}^*) = (\varphi_{ij}^*)^{-\gamma}$, and $1-G(\varphi_{ii}^*) = (\varphi_{ii}^*)^{-\gamma}$, and that $M_{ij} = \big[[1 - G(\varphi_{ij}^*)]/[1 - G(\varphi_{ii}^*)]\big] M_i$, then[9]

$$\begin{aligned} X_{ij} =& M_{ij} \int_{\varphi_{ij}^*}^{\infty} \left(\frac{w_i \tau_{ij}}{\rho \varphi P_j}\right)^{1-\sigma} \frac{E_j}{\sigma} \sigma \gamma \varphi^{-(\gamma+1)} (\varphi_{ij}^*)^{\gamma} \\ =& M_{ij} \left(\frac{w_i \tau_{ij}}{\rho P_j}\right)^{1-\sigma} \frac{E_j}{\sigma} \sigma \gamma (\varphi_{ij}^*)^{\gamma} \int_{\varphi_{ij}^*}^{\infty} \varphi^{-\gamma+\sigma-2} d\varphi \end{aligned}$$

Using equation (37) and solving the integral yields:

$$X_{ij} = (\alpha_i L_i)(\varphi_{ij}^*)^{-\gamma} \left(\frac{\sigma \gamma}{\gamma - (\sigma - 1)}\right) (\varphi_{ij}^*)^{\sigma-1} \left(\frac{w_i \tau_{ij}}{\rho P_j}\right)^{1-\sigma} \left(\frac{E_j}{\sigma}\right)$$

Using equation (9):

$$X_{ij} = (\alpha_i L_i)(\varphi_{ij}^*)^{-\gamma} \left(\frac{\sigma \gamma}{\gamma - (\sigma - 1)}\right) w_j \left[A_{ij} + (\alpha_i L_i)^{-\eta} (\varphi_{ij}^*)^{\eta\gamma}\right] \tag{39}$$

which is the analogue to equation (15) in Redding (2011).

A2.5: Price Indexes

Since we assume the Pareto distribution for productivities, we can write:

$$P_j^{1-\sigma} = \sum_{i=1}^{N} M_i \left(\frac{\varphi_{ij}^*}{\varphi_{ii}^*}\right)^{-\gamma} \int_{\varphi_{ij}^*}^{\infty} \left(\frac{w_i \tau_{ij}}{\rho \varphi}\right)^{1-\sigma} (\varphi_{ij}^*)^{\gamma} \gamma \varphi^{-(\gamma+1)} d\varphi. \tag{40}$$

Integrating yields:

$$P_j^{1-\sigma} = \sum_{i=1}^{N} M_i \left(\frac{\varphi_{ij}^*}{\varphi_{ii}^*}\right)^{-\gamma} \left(\frac{w_i \tau_{ij}}{\rho}\right)^{1-\sigma} \left(\frac{\gamma}{\gamma - (\sigma - 1)}\right) (\varphi_{ij}^*)^{\sigma-1}. \tag{41}$$

[9]Recall, $\varphi_{min} = 1$ by assumption, for simplicity of notation.

Define $\tilde{\varphi}^*_{ij} = \left(\frac{\gamma}{\gamma-(\sigma-1)}\right)^{\frac{1}{\sigma-1}} \varphi^*_{ij}$. then:

$$P_j^{1-\sigma} = \sum_{i=1}^{N} M_i \left(\frac{\varphi^*_{ij}}{\varphi^*_{ii}}\right)^{-\gamma} \left(\frac{w_i\tau_{ij}}{\rho\tilde{\varphi}^*_{ij}}\right)^{1-\sigma} \tag{42}$$

or:

$$P_j = \left[\sum_{i=1}^{N} M_i \left(\frac{\varphi^*_{ij}}{\varphi^*_{ii}}\right)^{-\gamma} \left(p_{ij}(\tilde{\varphi}^*_{ij})\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}}. \tag{43}$$

A2.6: Tariff Revenues

We know that tariff revenues for country j are:

$$T_j = \sum_{i=1}^{N} M_i \left(\frac{\varphi^*_{ij}}{\varphi^*_{ii}}\right)^{-\gamma} (t_{ij}-1) \int_{\varphi^*_{ij}}^{\infty} \left(\frac{w_i\tau_{ij}}{\rho\varphi P_j}\right)^{1-\sigma} E_j(\varphi^*_{ij})^{\gamma}\gamma\varphi^{-(\gamma+1)}d\varphi \tag{44}$$

where $nt_{ij} = t_{ij} - 1$. Integrating yields:

$$T_j = \sum_{i=1}^{N} M_i \left(\frac{\varphi^*_{ij}}{\varphi^*_{ii}}\right)^{-\gamma} (t_{ij}-1) \left(\frac{w_i\tau_{ij}}{\rho P_j}\right)^{1-\sigma} \frac{E_j}{\sigma} \left(\frac{\sigma\gamma}{\gamma-(\sigma-1)}\right) (\varphi^*_{ij})^{\sigma-1}. \tag{45}$$

Substituting in equation (9) yields:

$$T_j = \sum_{i=1}^{N} M_i \left(\frac{\varphi^*_{ij}}{\varphi^*_{ii}}\right)^{-\gamma} (t_{ij}-1) \left(\frac{\sigma\gamma}{\gamma-(\sigma-1)}\right) w_i \left[A_{ij} + (\alpha_i L_i)^{-\eta}(\varphi^*_{ij})^{\eta\gamma}\right]. \tag{46}$$

A2.7: Wage Rates

Finally, using equation (39), we know that the share of expenditures in market j from market i is:

$$\lambda_{ij} = \frac{\alpha_i L_i(\varphi^*_{ij})^{-\gamma}[A_{ij} + (\alpha_i L_i)^{-\eta}(\varphi^*_{ij})^{\eta\gamma}]}{\sum_i \alpha_i L_i(\varphi^*_{ij})^{-\gamma}[A_{ij} + (\alpha_i L_i)^{-\eta}(\varphi^*_{ij})^{\eta\gamma}]}. \tag{47}$$

The equilibrium wage rate in each country is implicitly determined from the N requirements that total revenue equals total expenditure on goods produced in each country:

$$w_i L_i = \sum_j \lambda_{ij}(w_j L_j + T_j). \tag{48}$$

Online Appendix 3: Comparative Statics

Before deriving the comparative statics, it will be useful to re-examine equation (39) in Online Appendix 2. We can rewrite this as:

$$X_{ij} = \left(\frac{\sigma\gamma}{\gamma-(\sigma-1)}\right)(\alpha_i L_i)A_{ij}w_j(\varphi_{ij}^*)^{-\gamma}\left[1+\frac{(\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}}{A_{ij}}\right] \tag{1}$$

Note that equation (1) above is identical to equation (15) in Redding (2011), with the exception of the additional last RHS term in equation (1) (and slightly different notation). While Redding (2011) denoted w_jA_{ij} (and analogously here $w_jA_{ij}\big[1+\frac{(\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}}{A_{ij}}\big]$) the "intensive" margin, we know this is more accurately termed the "average exports (per firm)" margin, since it is composed of the actual intensive margin and a "compositional" margin, as clarified in Head and Mayer (2014). In Redding (2011), the average exports margin is only sensitive to w_jA_{ij}. As equation (1) confirms, the simple introduction here of additively separable exogenous and endogenous export fixed costs introduces that the important trade elasticity of (variable) trade costs τ_{ij} is now endogenous. While this elasticity is influenced by γ as standard, it is also sensitive to the *level* (and share) of exogenous export fixed costs A_{ij}; this is a central theoretical contribution of our model. Note furthermore that, as in the case of Krautheim (2012) where exogenous export fixed costs and endogenous export fixed costs are related multiplicatively, then the φ_{ij}^* terms can be combined into one term and the trade elasticity of (variable) trade costs is only *magnified*, not made endogenous. Moreover, it is apparent from equation (1) that γ, η and σ are all relevant for the stability condition.

However, as just discussed, $w_jA_{ij}\big[1+\frac{(\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}}{A_{ij}}\big]$ is not the intensive margin; it is the product of the intensive margin and composition margin. For the empirical approach in our paper using the Hummels and Klenow (2005) extensive-intensive margin decomposition, we follow Chaney (2008) to arrive at the theoretical variable- and fixed-export-cost extensive-margin, intensive-margin, and trade elasticities for our model.

We can decompose the change in the aggregate trade flow into changes in the intensive and extensive margins. Aggregate trade can be written as:

$$X_{ij} = w_i L_i \int_{\varphi_{ij}^*}^{\infty} x_{ij}(\varphi)dG(\varphi)$$

Using Leibniz rule to separate the intensive and extensive margins, differentiation with respect to τ_{ij} yields:

$$dX_{ij} = \left[w_i L_i \int_{\varphi_{ij}^*}^{\infty} \frac{\partial x_{ij}(\varphi)}{\partial \tau_{ij}} dG(\varphi)\right] d\tau_{ij} - \left[w_i L_i x(\varphi_{ij}^*) G'(\varphi_{ij}^*) \frac{\partial \varphi_{ij}^*}{\partial \tau_{ij}}\right] d\tau_{ij} \tag{2}$$

The first RHS term is the intensive margin change and the second RHS term is the "extensive" margin change, for which the latter is now defined to include the "composition" change, cf., Head and Mayer (2014). It will be useful first to solve for $\partial \ln \varphi_{ij}^*/\partial \ln \tau_{ij}$ and for $\partial \ln \tau_{ij}/\partial \ln t_{ij}$.

A3.1: Solutions for $\partial \ln \varphi_{ij}^*/\partial \ln \tau_{ij}$ and $\partial \ln \tau_{ij}/\partial \ln t_{ij}$

The solution for $\partial \ln \varphi_{ij}^*/\partial \ln \tau_{ij}$ starts with ZPC condition (9) in Online Appendix 2 (on p.11 above), rewritten below in log-linear form (after cancelling the w_j's):

$$(1-\sigma)\ln w_i + (1-\sigma)\ln \tau_{ij} + (\sigma-1)\ln \rho + (\sigma-1)\ln P_j + \ln L_j + \ln\left(1+\frac{T_j}{w_j L_j}\right) - \ln \sigma$$
$$+ (\sigma-1)\ln \varphi_{ij}^* = \ln\left[A_{ij} + (\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}\right] \quad .$$

Noting ρ, σ, L_j are exogenous, we will differentiate the equation above holding w_i constant. As discussed earlier in this appendix, exogenous changes in τ_{ij} will influence X_{ij} via changes in $(\varphi_{ij}^*)^{-\gamma}$, $(\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}$, and also w_j. To separate – using Head and Mayer (2014) terminology – the "Partial and Modular (or Multilateral Resistance) Trade Impacts" from the "General Equilibrium (or Income) Impacts," we hold constant w_i in our derivation. Consequently, we can then distinguish in the last section of the paper (section 4) the "partial" (including MR terms) effects from the general equilibrium effects (allowing w to change also). As noted at the end of Online Appendix 2, we can only solve implicitly for national wage rates.[10]

Differentiating the equation above (allowing P_j and endogeneous fixed costs to adjust) yields:[11]

$$\frac{T_j}{w_j L_j + T_j} d\ln T_j + (1-\sigma) d\ln \tau_{ij} + (\sigma-1) d\ln P_j + (\sigma-1) d\ln \varphi_{ij}^*$$
$$= \eta\gamma\left[\frac{(\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}}{A_{ij} + (\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}}\right] d\ln \varphi_{ij}^* \qquad (2a)$$
$$= \eta\gamma s_{ij} d\ln \varphi_{ij}^*$$

where s_{ij} is a function of the *initial* cutoff productivity level:

$$s_{ij} = \frac{(\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}}{A_{ij} + (\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\eta\gamma}} \quad .$$

[10] However, we will find using 2,460 simulations of EIA formations in the last section of the paper that unique national wage rates are determined that satisfy the multilateral trade-balance conditions. Also, instead we could always have assumed a two-good model initially where the other good was an internationally costlessly traded homogeneous (numeraire) good (with perfect competition) wherein the national wage rates would have been equalized among all countries and assumed equal to unity.

[11] We omit the second-order effects of T_j on α_j due to α_j in the numerator and denominator.

Since:

$$(\sigma-1)d\ln P_j = \frac{\sigma-1}{P_j}dP_j$$

we can substitute in equation (26) from Online Appendix 2 to write:

$$(\sigma-1)d\ln P_j = \frac{\sigma-1}{P_j}d\left[\sum_i M_i\left(\frac{\varphi_{ii}^*}{\varphi_{ij}^*}\right)^{\gamma}(\varphi_{ij}^*)^{\sigma-1}\left(\frac{\gamma}{\gamma-\sigma+1}\right)\left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}} \quad .$$

Since $M_i = \alpha_i L_i (\varphi_{ii}^*)^{-\gamma}$, then

$$(\sigma-1)d\ln P_j = \frac{\sigma-1}{P_j}d\left[\sum_i \alpha_i L_i (\varphi_{ij}^*)^{-[\gamma-(\sigma-1)]}\left(\frac{\gamma}{\gamma-\sigma+1}\right)\left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{1-\sigma}\right]^{\frac{1}{1-\sigma}} \quad .$$

Focusing on $d\varphi_{ij}^*$ and $d\tau_{ij}$:

$$\begin{aligned}
(\sigma-1)d\ln P_j &= \frac{\sigma-1}{P_j}\left(\frac{1}{1-\sigma}\right)P_j^{\sigma}\alpha_i L_i\left(\frac{\gamma}{\gamma-\sigma+1}\right)\left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{1-\sigma}(-\gamma+\sigma-1)(\varphi_{ij}^*)^{-\gamma+\sigma-2}d\varphi_{ij}^* \\
&+ \frac{\sigma-1}{P_j}\left(\frac{1}{1-\sigma}\right)P_j^{\sigma}\alpha_i L_i\left(\frac{\gamma}{\gamma-\sigma+1}\right)(\varphi_{ij}^*)^{-(\gamma-\sigma+1)}(1-\sigma)\left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{-\sigma}\left(\frac{\sigma}{\sigma-1}\right)d\tau_{ij} \\
&= \left[(-1)P_j^{\sigma-1}\alpha_i L_i\right]\left[(-\gamma)\left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{1-\sigma}(\varphi_{ij}^*)^{-\gamma+\sigma-1}d\ln\varphi_{ij}^*\right] \\
&+ \left[(-1)P_j^{\sigma-1}\alpha_i L_i\right]\left[\left(\frac{-\gamma\sigma}{\gamma-\sigma+1}\right)(\varphi_{ij}^*)^{-(\gamma-\sigma+1)}\left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{1-\sigma}d\ln\tau_{ij}\right] \quad .
\end{aligned}$$

We can substitute the equation above for $(\sigma-1)d\ln P_j$ in equation (2a) to yield:

$$\begin{aligned}
\left(\frac{T_j}{w_jL_j+T_j}\right)d\ln T_j + (1-\sigma)d\ln\tau_{ij} + (\sigma-1)d\ln\varphi_{ij}^* + \gamma\alpha_i L_i\left(\frac{\frac{\sigma}{\sigma-1}\tau_{ij}}{P_j}\right)^{1-\sigma}\left(\varphi_{ij}^*\right)^{-\gamma+\sigma-1}d\ln\varphi_{ij}^* \\
+\frac{\sigma\left(\frac{\gamma}{\gamma-\sigma+1}\right)\alpha_i L_i\left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{1-\sigma}\left(\varphi_{ij}^*\right)^{-(\gamma-\sigma+1)}}{P_j^{1-\sigma}}d\ln\tau_{ij} \\
= \gamma\eta s_{ij}d\ln\varphi_{ij}^*
\end{aligned}$$

$$\begin{aligned}
\Rightarrow \left(\frac{T_j}{w_jL_j+T_j}\right)d\ln T_j + (1-\sigma)d\ln\tau_{ij} + \sigma\hat{\theta}_{ij}d\ln\tau_{ij} + (\sigma-1)d\ln\varphi_{ij}^* \\
+(\gamma-\sigma+1)\hat{\theta}_{ij}d\ln\varphi_{ij}^* - \gamma\eta s_{ij}d\ln\varphi_{ij}^* = 0
\end{aligned}$$

where

$$\hat{\theta}_{ij} = \frac{\left(\frac{\gamma}{\gamma-\sigma+1}\right) \alpha_i L_i \left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{1-\sigma} (\varphi^*_{ij})^{-(\gamma-\sigma+1)}}{\sum_i \left(\frac{\gamma}{\gamma-\sigma+1}\right) \alpha_i L_i \left(\frac{\sigma}{\sigma-1}\tau_{ij}\right)^{1-\sigma} (\varphi^*_{ij})^{-(\gamma-\sigma+1)}}$$
$$= \frac{\left[1-G(\varphi^*_{ij})\right] \alpha_i L_i \left(\frac{\tau_{ij}}{\varphi^*_{ij}}\right)^{1-\sigma}}{\sum_i \left[1-G(\varphi^*_{ij})\right] \alpha_i L_i \left(\frac{\tau_{ij}}{\varphi^*_{ij}}\right)^{1-\sigma}} \quad .$$

Then

$$\left[\sigma - 1 + \gamma\hat{\theta}_{ij} - (\sigma-1)\hat{\theta}_{ij} - \gamma\eta s_{ij}\right] d\ln\varphi^*_{ij} = \left[-(1-\sigma) - \sigma\hat{\theta}_{ij}\right] d\ln\tau_{ij} - \left(\frac{T_j}{w_j L_j + T_j}\right) d\ln T_j$$
$$= \left[\sigma - 1 - \sigma\hat{\theta}_{ij} - \left(\frac{T_j}{w_j L_j + T_j}\right)\epsilon^{T_j}_{\tau_{ij}}\right] d\ln\tau_{ij}$$

where $\epsilon^{T_j}_{\tau_{ij}} = \partial \ln T_j / \partial \ln \tau_{ij}$.

This implies:

$$\frac{d\ln\varphi^*_{ij}}{d\ln\tau_{ij}} = \frac{(\sigma-1) - \sigma\hat{\theta}_{ij} - \left(\frac{T_j}{w_j L_j + T_j}\right)\epsilon^{T_j}_{\tau_{ij}}}{(\sigma-1)(1-\hat{\theta}_{ij}) - \gamma(\eta s_{ij} - \hat{\theta}_{ij})}$$
$$= \frac{\sigma(1-\hat{\theta}_{ij}) - 1 - \left(\frac{T_j}{w_j L_j + T_j}\right)\epsilon^{T_j}_{\tau_{ij}}}{(\sigma-1)(1-\hat{\theta}_{ij}) - \gamma(\eta s_{ij} - \hat{\theta}_{ij})} \quad .$$

If $\hat{\theta}_{ij} \cong 0$ as in Chaney (2008) and Krautheim (2012) and we assume $\left(\frac{T_j}{w_j L_j + T_j}\right)\epsilon^{T_j}_{\tau_{ij}} \cong 0$, then:

$$\frac{d\ln\varphi^*_{ij}}{d\ln\tau_{ij}} = \frac{\sigma-1}{\sigma-1-\gamma\eta s_{ij}}$$
$$= \frac{1}{1 - \frac{\gamma}{\sigma-1}\eta s_{ij}} \quad .$$

Since $\tau_{ij} = t_{ij} + fr_{ij}$, it is straightforward to show that $d\ln\tau_{ij}/d\ln t_{ij} = \frac{1}{1+\frac{fr_{ij}}{t_{ij}}}$.

A3.2: Comparative Statics for Ad Valorem Tariff Rates

Comparative Static 1

Using equation (2), the extensive margin elasticity with respect to a one percent change in τ_{ij} is:

$$\frac{d\ln EM_{ij}}{d\ln\tau_{ij}} = \frac{-\tau_{ij}}{X_{ij}}\left(w_i L_i x(\varphi_{ij}^*)G'(\varphi_{ij}^*)\frac{\partial\varphi_{ij}^*}{\partial\tau_{ij}}\right) \tag{3}$$

From Chaney (2008, p. 1720) and Krautheim (2012, footnote 26), we know that:

$$X_{ij} = w_i L_i x(\varphi_{ij}^*)G'(\varphi_{ij}^*)\varphi_{ij}^*\left(\frac{1}{\gamma-(\sigma-1)}\right)$$

Substituting $X_{ij}[\gamma-(\sigma-1)](\varphi_{ij}^*)^{-1}$ for $w_i L_i x(\varphi_{ij}^*)G'(\varphi_{ij}^*)$ in equation (3) yields:

$$\frac{d\ln EM_{ij}}{d\ln\tau_{ij}} = -[\gamma-(\sigma-1)]\frac{\partial\ln\varphi_{ij}^*}{\partial\ln\tau_{ij}}.$$

We solved above in section A3.1 for $\frac{\partial\ln\varphi_{ij}^*}{\partial\ln\tau_{ij}}$ and $\frac{\partial\ln\tau_{ij}}{\partial\ln t_{ij}}$ and substituting yields:

$$\frac{d\ln EM_{ij}}{d\ln t_{ij}} = -\left(\frac{1}{1+\frac{fr_{ij}}{t_{ij}}}\right)\left(\frac{\gamma-(\sigma-1)}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}\right) < 0$$

where s_{ij}, defined earlier, is one minus the relative importance of exogenous export fixed costs in total export fixed costs.

Comparative Static 2

Comparative Static 2 is the intensive margin elasticity of trade to a one percent change in τ_{ij}. At $\partial\varphi_{ij}^*/\partial\tau_{ij} = 0$, the elasticity of equilibrium individual exports, x_{ij}, to $\partial\ln\tau_{ij}$ is:

$$\frac{\partial\ln x_{ij}}{\partial\ln t_{ij}} = \frac{\partial x_{ij}/x_{ij}}{\partial t_{ij}/t_{ij}} = -\left(\frac{1}{1+\frac{fr_{ij}}{t_{ij}}}\right)(\sigma-1)$$

Integration over all exporters yields:

$$\frac{d\ln IM_{ij}}{d\ln t_{ij}} = -\left(\frac{1}{1+\frac{fr_{ij}}{t_{ij}}}\right)(\sigma-1) < 0.$$

Comparative Static 3

Comparative Static 3 is the sum of the extensive margin and intensive margin elasticities of trade to a one percent change in τ_{ij}:

$$\frac{d\ln X_{ij}}{d\ln t_{ij}} = -\left(\frac{1}{1+\frac{fr_{ij}}{t_{ij}}}\right)\left[(\sigma-1)+\left(\frac{\gamma-(\sigma-1)}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}\right)\right] < 0. \tag{4}$$

A3.3: Comparative Statics for Policy-Oriented Export Fixed Costs

Similar to Comparative Statics 1-3, we can decompose the change in the aggregate trade flows into changes in the intensive and extensive margins using Leibniz rule.

Comparative Static 4

Using the definition of the equilibrium productivity threshold and the same procedure as in Comparative Static 1, the elasticity of the extensive margin with respect to a one percent change in A_{ij}^P – Comparative Static 4 – is:

$$\frac{d\ln EM_{ij}}{d\ln A_{ij}^P} = -\left(\frac{\frac{\gamma}{\sigma-1}-1}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}\right)\left(\frac{A_{ij}^P}{A_{ij}^N+A_{ij}^P+(\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\gamma\eta}}\right) < 0. \tag{5}$$

Comparative Static 5

Using the definition of the equilibrium firm-level exports, $\partial x_{ij}(\varphi)/\partial A_{ij}^P = 0$. Consequently, the elasticity of the intensive margin with respect to a one percent change in A_{ij}^P is:

$$\frac{d\ln IM_{ij}}{d\ln A_{ij}^P} = 0. \tag{6}$$

which is Comparative Static 5 in the paper.

Comparative Static 6

Comparative Static 6 is the sum of the extensive margin and intensive margin elasticities of trade to a one percent change in A_{ij}^P:

$$\frac{d\ln X_{ij}}{d\ln A_{ij}^P} = -\left(\frac{\frac{\gamma}{\sigma-1}-1}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}\right)\left(\frac{A_{ij}^P}{A_{ij}^N+A_{ij}^P+(\alpha_i L_i)^{-\eta}(\varphi_{ij}^*)^{\gamma\eta}}\right) < 0. \tag{7}$$

A3.4: Proof

The following derivation proves that $d\ln(-\frac{d\ln EM_{ij}}{d\ln A^P_{ij}})/dA^P_{ij}$ is positive. Starting with equation (5) above:

$$
\begin{aligned}
\frac{d\ln\left(-\frac{d\ln EM_{ij}}{d\ln A^P_{ij}}\right)}{dA^P_{ij}} &= d\ln\left(\frac{\gamma}{\sigma-1}-1\right)/dA^P_{ij} - d\ln\left(1-\frac{\gamma}{\sigma-1}\eta s_{ij}\right)/dA^P_{ij} \\
&+ d\ln A^P_{ij}/dA^P_{ij} - d\ln\left(A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}\right)/dA^P_{ij} \\
&= 0 - \left(\frac{1}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}\right)\left(-\frac{\gamma}{\sigma-1}\eta\right)\frac{ds_{ij}}{dA^P_{ij}} + \frac{1}{A^P_{ij}}\frac{dA^P_{ij}}{dA^P_{ij}} \\
&\quad - \left(\frac{1}{A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}}\right)\frac{dA^P_{ij}}{dA^P_{ij}} \\
&= \frac{\frac{\gamma}{\sigma-1}\eta}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}\frac{ds_{ij}}{dA^P_{ij}} + \frac{1}{A^P_{ij}} - \frac{1}{A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}} \qquad (8)
\end{aligned}
$$

recalling that:

$$
\begin{aligned}
\frac{ds_{ij}}{dA^P_{ij}} &= \frac{\left(A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}\right)(0) - M^{-\eta}_{ij}(1)}{(A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij})^2} \\
&= \frac{-M^{-\eta}_{ij}}{\left(A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}\right)^2}
\end{aligned}
$$

Substituting the equation above into equation (8) yields:

$$
\begin{aligned}
\frac{d\ln\left(-\frac{d\ln EM_{ij}}{d\ln A^P_{ij}}\right)}{dA^P_{ij}} &= \left(\frac{\frac{\gamma}{\sigma-1}\eta}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}\right)\left(-\frac{M^{-\eta}_{ij}}{(A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij})^2}\right) + \frac{1}{A^P_{ij}} - \frac{1}{A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}} \\
&= \frac{1}{A^P_{ij}} + \frac{\frac{\gamma}{\sigma-1}\eta}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}(-1)s_{ij}\frac{1}{A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}} - \frac{1}{A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}} \\
&= \frac{1}{A^P_{ij}} + \frac{1}{A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}}\left[\frac{-\frac{\gamma}{\sigma-1}\eta s_{ij}}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}} - 1\right] \\
&= \frac{1}{A^P_{ij}} + \frac{1}{A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}}\left[\frac{-\frac{\gamma}{\sigma-1}\eta s_{ij} - 1 + \frac{\gamma}{\sigma-1}\eta s_{ij}}{1-\frac{\gamma}{\sigma-1}\eta s_{ij}}\right] \\
&= \frac{1}{A^P_{ij}} - \frac{1}{\left[A^N_{ij}+A^P_{ij}+M^{-\eta}_{ij}\right]\left[1-\frac{\gamma}{\sigma-1}\eta s_{ij}\right]}
\end{aligned}
$$

The necessary condition for the RHS to be positive is:

$$\begin{aligned}
&\frac{1}{A_{ij}^P} - \frac{1}{\left[A_{ij}^N + A_{ij}^P + M_{ij}^{-\eta}\right]\left[1 - \frac{\gamma}{\sigma-1}\eta s_{ij}\right]} > 0 \\
&\Rightarrow \left(A_{ij}^N + A_{ij}^P + M_{ij}^{-\eta}\right)\left[1 - \frac{\gamma}{\sigma - 1}\eta s_{ij}\right] > A_{ij}^P \\
&\Rightarrow 1 - \frac{\gamma}{\sigma - 1}\eta s_{ij} > \frac{A_{ij}^P}{A_{ij}^N + A_{ij}^P + M_{ij}^{-\eta}} \\
&\Rightarrow 1 > \frac{A_{ij}^P + \frac{\gamma}{\sigma-1}\eta(M_{ij}^{-\eta})}{A_{ij}^N + A_{ij}^P + M_{ij}^{-\eta}} \\
&\Rightarrow A_{ij}^N + M_{ij}^{-\eta} > \frac{\gamma}{\sigma - 1}\eta M_{ij}^{-\eta} \\
&\Rightarrow \frac{A_{ij}^N}{M_{ij}^{-\eta}} + 1 > \frac{\gamma\eta}{\sigma - 1}
\end{aligned}$$

Assuming, as in Krautheim (2012), that:

$$\frac{\gamma}{\sigma - 1}\eta < 1$$

then:

$$\frac{d\ln\left[-\frac{\delta \ln EM_{ij}}{\delta \ln A_{ij}^P}\right]}{dA_{ij}^P} > 0 \quad .$$

Online Appendix 4: Economic Integration Agreements and Country List[12]

ECONOMIC UNIONS

Euro Area (1999): Austria, Belgium, Cyprus (2008), Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta (2008), Netherlands, Portugal, Slovak Republic (2008), Slovenia (2008), Spain
West African Economic and Monetary Union (UEMOA/WAEMU) (2000): Benin, Burkina Faso, Guinea-Bissau, Ivory Coast, Mali, Niger, Senegal, Togo
Economic and Monetary Community of Central Africa (CEMAC) (2000): Cameroon, Central African Republic, Chad, Equatorial Guinea, Gabon

COMMON MARKETS

European Economic Area (EEA) (1993): Austria (1994), Belgium, Bulgaria (2007), Cyprus (2005), Czech Republic (2005), Denmark, Estonia (2005), Finland (1994), France, Germany, Greece, Hungary (2005), Iceland (1994), Ireland, Italy, Latvia (2005), Lithuania (2005), Luxembourg, Malta (2005), Netherlands, Norway (1994), Poland (2005), Portugal, Romania (2007), Slovak Republic (2005), Slovenia (2005), Spain, Sweden (1994), UK
East African Community (EAC) (2001): Burundi (2008), Kenya, Rwanda (2008), Tanzania, Uganda

CUSTOMS UNION

Andean Community 1 (1995): Bolivia, Colombia, Ecuador, Peru, Venezuela
Caribbean Community and Common Market (CARICOM) (1975): Antigua And Barbuda, Bahamas (1984), Barbados, Belize, Dominica, Grenada, Guyana, Haiti (2003), Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname (1996), Trinidad and Tobago
Central American Common Market (CACM1) (1966-1969): Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
Eurasian Economic Community (EURASIAN) (2010): Belarus, Kazakhstan, Russia
European Economic Community (EEC) (1962-1992): Belgium, Denmark (1973), France, Germany, Greece (1981), Ireland (1973), Italy, Luxembourg, Netherlands, Portugal (1986), Spain (1986), UK (1973)
European Union Customs Union (EUCU): EU-San Marino (1993), EU-Cyprus (1993)

[12] Only countries in data set are listed.

Gulf Cooperation Council Customs Union (GCCCU) (2003): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
Mercado Comùn del Sur (MERCOSUR) (1995): Argentina, Brazil, Paraguay, Uruguay
Southern African Customs Union (SACU) (1970): Botswana, Lesotho, Namibia (1990), South Africa, Swaziland
West African Economic and Monetary Union (WAEMU) (1995-1999): Benin, Burkina Faso, Guinea-Bissau (1997), Ivory Coast, Mali, Niger, Senegal, Togo
Czech Republic-Slovak Republic (1993-2004)

FREE TRADE AGREEMENTS

I. PLURILATERAL AGREEMENTS

Andean Community 2 (1993-1994): Bolivia, Colombia, Ecuador, Venezuela
Arab Common Market (ACM) (1965): Egypt, Iraq, Syria, Yemen
ASEAN-ANZERTA (2010): Australia, New Zealand and ASEAN members
Association of Southeast Asian Nations (ASEAN) (2000): Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar (Burma), Philippines, Singapore, Thailand, Vietnam
Baltic FTA (BAFTA 1999-2004): Estonia , Latvia, Lithuania
Caribbean Free Trade Agreement (CARIFTA) (1968-1974): Antigua and Barbuda, Barbados, Belize (1971), Dominica, Grenada, Guyana, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago
Central American Common Market (CACM2) (1951-1965): Costa Rica (1963), El Salvador, Guatemala (1955), Honduras (1957), Nicaragua
Central American Common Market (CACM3) (1993): Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
Central European Free Trade Area (CEFTA) (1993): Albania (2007), Bosnia and Herzegovina (2007), Bulgaria (1999-2006), Croatia (2003), Czech Republic (until 2004), Hungary (1993-2004), Macedonia (2006), Moldova (2007), Poland (until 2004), Romania (1997-2006), Slovak Republic (1993-2004), Slovenia (1996-2004)
Colombia -Northern Triangle FTA: Colombia, Mexico, El Salvador, Guatemala, Honduras
Common Market for Eastern and Southern Africa (COMESA) (2001): Burundi (2005), Comoros (2006), Congo D.R., Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya (2006), Madagascar, Malawi, Mauritius, Rwanda (2005), Seychelles, Swaziland, Uganda, Sudan
Dominican Republic-Central America-United States FTA (2006) (CAFTA-DR): Costa Rica (2009), Dominican Republic (2007), El Salvador, Guatemala (2007), Honduras, Nicaragua, United States
European Free Trade Association (EFTA 1960): Austria (until 1995), Denmark (until 1973), Finland (1986-1995), Iceland (1970), Norway, Portugal (until 1986), Sweden (until

1995), Switzerland, United Kingdom (until 1973)
European Union (EU) (1958): Austria (1995), Belgium, Bulgaria (2007), Cyprus (2004), Czech Republic (2004), Denmark (1973), Estonia (2004), Finland (1995), France, Germany, Greece (1981), Hungary (2004), Ireland (1973), Italy, Latvia (2004), Lithuania (2004), Luxembourg, Malta (2004), Netherlands, Poland (2004), Portugal (1986), Slovak Republic (2004), Slovenia (2004), Spain (1986), Sweden (1995), United Kingdom (1973)
Gulf Cooperation Council (GCCFTA)(1983-2002): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
NAFTA (North American Free Trade Agreement 1994): Canada, Mexico, US
Pan-Arab Free Trade Area (1998) (PAFTA/GAFTA): Algeria (2009), Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon (1999), Libya (1999), Morocco, Oman, Palestine (2005), Qatar, Saudi Arabia, Sudan (2005), Syria, Tunisia, United Arab Emirates, Yemen (2005)
Pacific Island Countries Trade Agreements (2003) (PICTA): Fiji, Kiribati, Papua New Guinea, Solomon Islands, Tonga, Samoa
South Asian Free Trade Area (SAFTA)(2006): Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka
Southern African Development Community (SADC) (2001): Botswana, Congo D.R., Lesotho, Madagascar, Malawi (2009), Mauritius, Mozambique (2009), Namibia, South Africa, Swaziland, Tanzania (2009), Zambia, Zimbabwe
Trans-Pacific Partnership (TPP) (2006): Brunei, Chile, New Zealand, Singapore
West African Monetary Union (WAMU) (1962-1965): Burkina Faso, Mali, Mauritania, Niger, Senegal

II. BILATERAL AGREEMENTS

Albania-Bosnia and Herzegovina (2004-2006)
Albania-Croatia (2004-2006)
Albania-Macedonia (2003-2006)
Albania-Macedonia (2003-2006)
Albania-Romania (2004)
Andean Community 1-Chile (2005)
Andean Community 1-MERCOSUR (2005)
Angola-Egypt (2001)
Armenia-Georgia (1999)
Armenia-Kazakhstan (2002)
Armenia-Kyrgyz Republic (1996)
Armenia-Moldova (1996)
Armenia-Russia (1993)
Armenia-Turkmenistan (1997)
Armenia-Ukraine (1997)

ASEAN-China (2006)
ASEAN-India (2010)
ASEAN-Japan (2008)
ASEAN-South Korea (2007)
Australia-Chile (2009)
Australia-New Zealand (1983-2009)
Australia-Papua New Guinea (1977)
Australia-Singapore (2003-2009)
Australia-Thailand (2005-2009)
Australia-USA (2005)
Azerbaijan-Georgia (1997)
Azerbaijan-Russia (1993)
Azerbaijan-Ukraine (1997)
Bahrain-USA (2007)
Belarus-Russia (1993-2009)
Belarus-Ukraine (2007)
Bolivia-Chile (1996-2004)
Bolivia-Mexico (1995)
Bosnia and Herzegovina-Bulgaria (2005)
Bosnia and Herzegovina-Croatia (2001-2006)
Bosnia and Herzegovina-Macedonia, (2003-2005)
Bosnia and Herzegovina-Moldova (2005-2006)
Bosnia and Herzegovina-Romania (2004-2006)
Bosnia and Herzegovina-Slovenia (2002-2003)
Bulgaria-Israel (2002-2006)
Bulgaria-Macedonia (2000-2006)
Bulgaria-Moldova (2004)
CACM3-Dominican Republic (1998)
CACM3-Mexico (2001)
Cameroon-Gabon (1966-1999)
Canada-Chile (1997)
Canada-Israel (1997)
Canada-Peru (2010)
Canada-USA (1989-1993)
CARICOM-Costa Rica (2004)
CARICOM-Dominican Republic (1998)
CEFTA-Bulgaria (1993-1998)
Chile-China (2007)
Chile-Costa Rica (2002)
Chile-El Salvador (2003)
Chile-Japan (2008)
Chile-Korea (2004)

Chile-Mexico (2000)
Chile-Panama (2008)
Chile-USA (2004)
China-Costa Rica (2010)
China-Hong Kong (2004)
China-Macao (2004)
China-New Zealand (2009)
China-Nicaragua (2007)
China-Pakistan (2008)
China-Peru (2010)
Colombia-Mexico (1995-2009)
COMESA-SADC (2006)
Congo, Republic of-Gabon (1966)
Costa Rica-Mexico (1995-2000)
Croatia-Macedonia (2004)
Czech Republic-Estonia (1997)
Czech Republic-Israel (1997-2004)
Czech Republic-Latvia (1997-2004)
Czech Republic-Lithuania (1997-2004)
Czech Republic-Romania (1997-2006)
EEC-Israel (1975-1992)
EEA-Israel (1993)
EFTA-Albania (2010)
EFTA-Bulgaria (1994-2006)
EFTA-Canada (2010)
EFTA-Chile (2005)
EFTA-Croatia (2002)
EFTA-Czech Republic (1994-2004)
EFTA-Egypt (2007)
EFTA-Estonia (1997-2004)
EFTA-GCCCU (2009)
EFTA-Hungary (1994-2004)
EFTA-Israel (1993)
EFTA-Jordan (2002)
EFTA-Latvia (1996-2004)
EFTA-Lebanon (2007)
EFTA-Lithuania (1997-2004)
EFTA-Macedonia (2001)
EFTA-Mexico (2002)
EFTA-Morocco (2000)
EFTA-Poland (1994)
EFTA-Romania (1994-2006)

EFTA-SACU (2008)
EFTA-Singapore (2003)
EFTA-Slovak Republic (1993-2004)
EFTA-Slovenia (1995-2004)
EFTA-South Korea (2007)
EFTA-Tunisia (2005)
Egypt-Jordan (1999)
El Salvador-Panama (2003)
Estonia-Hungary (1999-2004)
Estonia-Slovak Republic (1997-2004)
Estonia-Slovenia (1997-2004)
EU-Algeria (2005)
EU-Bulgaria (1994-2006)
EU-Chile (2005)
EU-Croatia (2003)
EU-Cyprus (1988-2004)
EU-Czech Republic (1992-2004)
EU-EFTA (Agreement/European Economic Area 1973/1994)
EU-Egypt (2005)
EU-Estonia (1998-2004)
EU-Faroe Islands (1997)
EU-Hungary (1992-2004)
EU-Israel (2000)
EU-Jordan (2002)
EU-Lativa (1995-2004)
EU-Lebanon (2003)
EU-Lithuania (1995-2004)
EU-Macedonia (2002)
EU-Mexico (1998)
EU-Morocco (2001)
EU-Poland (1992-2004)
EU-Romania (1993-2006)
EU-Slovak Republic (1993-2004)
EU-Slovenia (1997-2004)
EU-South Africa (2000)
EU-Tunisia (1999)
Faroe Islands-Iceland (1994)
Faroe Islands-Norway (1994)
Faroe Islands-Poland (2000-2004)
Faroe Islands-Switzerland (1996)
Georgia-Kazakhstan (2000)
Georgia-Russia (1993)

Georgia-Turkmenistan (2000)
Georgia-Ukraine (1997)
Hungary-Israel (1998-2004)
Hungary-Latvia (2000-2004)
Hungary-Lithuania (2000-2004)
India-Sri Lanka (1999-2005)
India-Singapore (2006)
India-South Korea (2010)
Ireland-Latvia (1995)
Ireland-Lithuania (1995)
Israel-Mexico (2001)
Israel-Poland (1998-2004)
Israel-Romania (2002-2006)
Israel-Slovak Republic (1997-2004)
Israel-Slovenia (1999-2004)
Israel-USA (1986)
Japan-Switzerland (2010)
Jordan-Singapore (2006)
Jordan-USA (2002)
Kazakhstan-Kyrgyz Republic (1996)
Kazakhstan-Russia (1993-2009)
Kyrgyz Republic-Moldova (1997)
Kyrgyz Republic-Russia (1993)
Kyrgyz Republic-Ukraine (1998)
Kyrgyz Republic-Uzbekistan (1999-2007)
Latvia-Slovak Republic (1997-2004)
Lithuania-Poland (1997-2004)
Lithuania-Slovak Republic (1997-2004)
Lithuania-Slovenia (1997-2003)
Macedonia-Moldova (2005-2006)
Macedonia-Romania (2004-2006)
Macedonia-Slovenia (1997-2003)
Macedonia-Ukraine (2002-2005)
MERCOSUR-Bolivia (1996-2004)
MERCOSUR-Chile (1996)
MERCOSUR-Israel (2008)
Mexico-Colombia (1995)
Mexico-Japan (2005)
Mexico-Nicaragua (1999)
Mexico-Uruguay (2005)
Mexico-Venezuela (1995)
Moldova-Ukraine (2005)

Morocco-USA (2006)
New Zealand-Singapore (2001-2009)
New Zealand-Thailand (2006-2009)
Oman-USA (2009)
Pakistan-Sri Lanka (2005)
Panama-Singapore (2007)
Peru-Singapore (2010)
Peru-USA (2009)
Poland-Latvia (1999-2004)
Romania-Moldova (1995-2006)
Russia-Tajikistan (1993)
Russia-Turkmenistan (1993)
Russia-Ukraine (1994)
Russia-Uzbekistan (1993)
SADC-SACU (2009)
Slovak Republic-Estonia (1997)
Slovenia-Israel (1999)
Slovenia-Latvia (1997)
Tajikistan-Ukraine (1995)
Turkmenistan-Ukraine (1995)
TPP-China (2007)
Ukraine-Estonia (1997)
Ukraine-Uzbekistan (1996)
USA-Singapore (2004)

Country List

Country List

Afghanistan	Djibouti	Kuwait	Qatar
Albania	Dominica	Kyrgyz Republic	Romania
Algeria	Dominican Republic	Laos	Russian Federation
Angola	Ecuador	Latvia	Rwanda
Antigua And Barbuda	Egypt, Arab Rep.	Lebanon	Samoa
Argentina	El Salvador	Lesotho	San Marino
Armenia	Equatorial Guinea	Liberia	Sao Tome and Principe
Australia	Eritrea	Libya	Saudi Arabia
Austria	Estonia	Lithuania	Senegal
Azerbaijan	Ethiopia	Luxembourg	Seychelles
Bahamas	Faeroe Islands	Macao	Singapore
Bahrain	Fiji	Macedonia, FYR	Slovak Republic
Bangladesh	Finland	Madagascar	Slovenia
Barbados	France	Malawi	Solomon Islands
Belarus	Gabon	Malaysia	Somalia
Belgium	Gambia	Maldives	South Africa
Belize	Georgia	Mali	Spain
Benin	Germany	Malta	Sri Lanka
Bermuda	Ghana	Marshall Islands	St. Kitts and Nevis
Bhutan	Greece	Mauritania	St. Lucia
Bolivia	Greenland	Mauritius	St. Vincent and the Grenadines
Bosnia and Herzegovina	Grenada	Mexico	Sudan
Botswana	Guatemala	Micronesia	Suriname
Brazil	Guinea	Moldova	Swaziland
Brunei Darussalam	Guinea-Bissau	Mongolia	Sweden
Bulgaria	Guyana	Morocco	Switzerland
Burkina Faso	Haiti	Mozambique	Syrian Arab Republic
Burundi	Honduras	Myanmar (Burma)	Tajikistan
Cambodia	Hong Kong	Namibia	Tanzania
Cameroon	Hungary	Nepal	Thailand
Canada	Iceland	Netherlands	Togo
Cape Verde	India	New Caledonia	Tonga
Cayman Islands	Indonesia	New Zealand	Trinidad And Tobago
Central African Republic	Iran, Islamic Rep.	Nicaragua	Tunisia
Chad	Iraq	Niger	Turkmenistan
Chile	Ireland	Nigeria	Uganda
China	Israel	Norway	Ukraine
Colombia	Italy	Oman	United Arab Emirates
Comoros	Ivory Coast	Pakistan	United Kingdom
Congo, Dem. Rep.	Jamaica	Panama	United States
Costa Rica	Japan	Papua New Guinea	Uruguay
Croatia	Jordan	Paraguay	Uzbekistan
Cuba	Kazakhstan	Peru	Venezuela
Cyprus	Kenya	Philippines	Vietnam
Czech Republic	Kiribati	Poland	Yemen
Denmark	Korea, Rep.	Portugal	

Online Appendix 5: Tables 1-8 and Figures 2-5

Online Appendix 5

Table 1

(1) Variables	(2) Expected Sign Extensive	(3) Extensive	(4) Expected Sign Intensive	(5) Intensive	(6) Expected Sign Trade	(7) Trade
$OWPTA_t$	+	-0.032	+	-0.047	+	-0.079^{**}
		(-0.86)		(-1.50)		(-2.34)
$OWPTA_t$ * ln DIST	−	0.005	−	-0.119^{***}	−	-0.115^{***}
		(0.10)		(-3.18)		(-2.77)
$OWPTA_t$ * ADJ	−	0.321	+	-0.179	?	0.142
		(1.46)		(-1.18)		(0.76)
$OWPTA_t$ * LANG	+	0.187^{*}	0	-0.214^{**}	+	-0.027
		(1.89)		(-2.43)		(-0.27)
$OWPTA_t$ * RELIG	+	-0.095	0	0.040	+	-0.055
		(-1.08)		(0.51)		(-0.68)
$OWPTA_t$ * LEGAL	?	-0.147^{**}	0	0.146^{**}	?	-0.001
		(-2.25)		(2.57)		(-0.02)
$OWPTA_t$ * COLONY	?	-0.077	0	0.134	?	0.058
		(-0.58)		(1.17)		(0.45)
$TWPTA_t$	+	-0.003	+	0.041	+	0.038
		(-0.08)		(1.23)		(1.01)
$TWPTA_t$ * ln DIST	−	-0.009	−	-0.124^{***}	−	-0.134^{***}
		(-0.18)		(-3.18)		(-2.62)
$TWPTA_t$ * ADJ	−	-0.023	+	0.111	?	0.088
		(-0.17)		(1.22)		(0.67)
$TWPTA_t$ * LANG	+	0.097	0	-0.095	+	0.002
		(0.98)		(-1.39)		(0.02)
$TWPTA_t$ * RELIG	+	0.175^{*}	0	-0.114	+	0.061
		(1.70)		(-1.49)		(0.63)
$TWPTA_t$ * LEGAL	?	-0.075	0	0.032	?	-0.044
		(-1.02)		(0.54)		(-0.60)
$TWPTA_t$ * COLONY	?	0.093	0	-0.100	?	-0.007
		(0.81)		(-1.12)		(-0.07)
FTA_t	+	0.127^{***}	+	0.127^{***}	+	0.254^{***}
		(3.08)		(3.89)		(6.63)
FTA_t * ln DIST	−	-0.163^{***}	−	-0.044^{*}	−	-0.207^{***}
		(-4.66)		(-1.65)		(-6.28)
FTA_t * ADJ	−	-0.184	+	0.304^{***}	?	0.120
		(-1.56)		(3.95)		(1.07)
FTA_t * LANG	+	0.149^{*}	0	0.044	+	0.193^{**}
		(1.71)		(0.72)		(2.45)

(Continued)

Table 1

(1) Variables	(2) Expected Sign Extensive	(3) Extensive	(4) Expected Sign Intensive	(5) Intensive	(6) Expected Sign Trade	(7) Trade
FTA_t * RELIG	+	0.264***	0	−0.053	+	0.211***
		(3.19)		(−0.88)		(2.79)
FTA_t * LEGAL	?	−0.165**	0	0.069	?	−0.096
		(−2.50)		(1.45)		(−1.61)
FTA_t * COLONY	?	−0.302**	0	0.132	?	−0.170
		(−2.05)		(1.30)		(−1.41)
CU_t	+	0.177	+	0.474***	+	0.651***
		(0.79)		(3.11)		(4.07)
CU_t * ln DIST	−	−0.200	−	0.081	−	−0.119
		(−1.49)		(0.85)		(−1.25)
CU_t * ADJ	−	−0.190	+	0.267**	?	0.077
		(−1.07)		(1.97)		(0.52)
CU_t * LANG	+	0.607***	0	0.043	+	0.650***
		(2.94)		(0.30)		(4.33)
CU_t * RELIG	+	0.241	0	0.048	+	0.289**
		(1.57)		(0.34)		(2.17)
CU_t * LEGAL	?	0.043	0	0.042	?	0.085
		(0.35)		(0.45)		(0.80)
CU_t * COLONY	?	−1.119***	0	−0.024	?	−1.143***
		(−3.26)		(−0.13)		(−4.25)
CM_t	+	0.783***	+	−0.054	+	0.729***
		(6.65)		(−0.58)		(6.78)
CM_t * ln DIST	−	0.294***	−	−0.494***	−	−0.200***
		(3.92)		(−8.29)		(−2.76)
CM_t * ADJ	−	−0.224	+	0.196*	?	−0.028
		(−1.59)		(1.90)		(−0.19)
CM_t * LANG	+	0.525**	0	−0.496***	+	0.029
		(2.11)		(−3.14)		(0.14)
CM_t * RELIG	+	0.127	0	0.007	+	0.134
		(1.13)		(0.08)		(1.30)
CM_t * LEGAL	?	−0.045	0	0.018	?	−0.027
		(−0.48)		(0.25)		(−0.32)
CM_t * COLONY	?	−0.439*	0	0.263**	?	−0.176
		(−1.96)		(1.97)		(−0.84)
ECU_t	+	0.548***	+	0.262*	+	0.809***
		(3.17)		(1.86)		(5.05)
ECU_t * ln DIST	−	0.244*	−	−0.241**	−	0.004
		(1.86)		(−2.37)		(0.03)
ECU_t * ADJ	−	−0.297	+	0.215	?	−0.082
		(−1.56)		(1.44)		(−0.43)
ECU_t * LANG	+	0.729***	0	−0.303*	+	0.426**
		(3.55)		(−1.90)		(2.37)

(Continued)

Table 1

(1) Variables	(2) Expected Sign Extensive	(3) Extensive	(4) Expected Sign Intensive	(5) Intensive	(6) Expected Sign Trade	(7) Trade
ECU_t * RELIG	+	−0.055	0	0.433***	+	0.378**
		(−0.34)		(3.72)		(2.47)
ECU_t * LEGAL	?	−0.078	0	−0.043	?	−0.121
		(−0.69)		(−0.44)		(−1.14)
ECU_t * COLONY	?	0.224	0	0.345	?	0.568
		(0.56)		(1.57)		(1.23)
Fixed Effects:						
Exporter-Year		Yes		Yes		Yes
Importer-Year		Yes		Yes		Yes
Country-Pair		Yes		Yes		Yes
R^2		0.811		0.810		0.906
N		66,940		66,940		66,940

Notes: *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. Cutoff for nontraded goods is $1,000,000; this affects the sample size. t-statistics are in parentheses.

Table 2

(1) Variables	(2) Expected Sign Extensive	(3) Extensive	(4) Expected Sign Intensive	(5) Intensive	(6) Expected Sign Trade	(7) Trade
$OWPTA_t$	+	-0.032	+	-0.034	+	-0.065^{**}
		(-1.05)		(-1.12)		(-2.00)
$OWPTA_t$ * ln DIST	−	0.007	−	-0.099^{***}	−	-0.092^{**}
		(0.20)		(-2.75)		(-2.26)
$OWPTA_t$ * ADJ	−	0.236	+	-0.190	?	0.046
		(1.06)		(-1.61)		(0.20)
$OWPTA_t$ * LANG	+	0.027	0	-0.154^{*}	+	-0.127
		(0.30)		(-1.68)		(-1.21)
$OWPTA_t$ * RELIG	+	-0.124^{*}	0	0.113	+	-0.010
		(-1.68)		(1.52)		(-0.13)
$OWPTA_t$ * LEGAL	?	-0.255^{***}	0	0.203^{***}	?	-0.052
		(-4.55)		(3.51)		(-0.81)
$OWPTA_t$ * COLONY	?	0.070	0	0.042	?	0.112
		(0.54)		(0.35)		(0.68)
$TWPTA_t$	+	0.056^{*}	+	0.004	+	0.060^{*}
		(1.67)		(0.13)		(1.69)
$TWPTA_t$ * ln DIST	−	0.013	−	-0.129^{***}	−	-0.116^{**}
		(0.28)		(-3.49)		(-2.35)
$TWPTA_t$ * ADJ	−	0.158	+	0.093	?	0.251^{*}
		(1.26)		(1.05)		(1.87)
$TWPTA_t$ * LANG	+	0.040	0	-0.027	+	0.013
		(0.51)		(-0.40)		(0.16)
$TWPTA_t$ * RELIG	+	0.121	0	-0.062	+	0.059
		(1.49)		(-0.86)		(0.68)
$TWPTA_t$ * LEGAL	?	-0.128^{**}	0	0.110^{**}	?	-0.018
		(-2.08)		(1.98)		(-0.27)
$TWPTA_t$ * COLONY	?	-0.110	0	-0.149	?	-0.258^{**}
		(-1.24)		(-1.64)		(-2.56)
FTA_t	+	-0.012	+	0.246^{***}	+	0.234^{***}
		(-0.33)		(7.68)		(6.37)
FTA_t * ln DIST	−	-0.078^{***}	−	-0.073^{***}	−	-0.151^{***}
		(-2.71)		(-2.80)		(-4.91)
FTA_t * ADJ	−	-0.268^{***}	+	0.321^{***}	?	0.052
		(-2.81)		(4.10)		(0.48)
FTA_t * LANG	+	0.097	0	0.097^{*}	+	0.194^{***}
		(1.43)		(1.68)		(2.67)
FTA_t * RELIG	+	0.182^{***}	0	0.111^{**}	+	0.293^{***}
		(2.83)		(2.01)		(4.27)
FTA_t * LEGAL	?	-0.139^{***}	0	0.036	?	-0.103^{*}
		(-2.63)		(0.81)		(-1.82)
FTA_t * COLONY	?	-0.518^{***}	0	0.174^{*}	?	-0.344^{***}

(Continued)

Table 2

(1) Variables	(2) Expected Sign Extensive	(3) Extensive	(4) Expected Sign Intensive	(5) Intensive	(6) Expected Sign Trade	(7) Trade
		(−4.78)		(1.89)		(−2.96)
CU_t	+	0.011	+	0.550***	+	0.561***
		(0.06)		(3.85)		(3.45)
CU_t * ln DIST	−	−0.072	−	0.009	−	−0.064
		(−0.64)		(0.10)		(−0.64)
CU_t * ADJ	−	−0.239	+	0.256**	?	0.017
		(−1.44)		(2.07)		(0.11)
CU_t * LANG	+	0.491***	0	0.171	+	0.662***
		(2.88)		(1.41)		(4.47)
CU_t * RELIG	+	0.088	0	0.253*	+	0.340**
		(0.58)		(1.83)		(2.28)
CU_t * LEGAL	?	0.109	0	−0.078	?	0.031
		(0.97)		(−0.88)		(0.28)
CU_t * COLONY	?	−1.176***	0	0.021	?	−1.155***
		(−4.22)		(0.11)		(−4.54)
CM_t	+	0.465***	+	0.105	+	0.570***
		(4.93)		(1.19)		(5.55)
CM_t * ln DIST	−	0.274***	−	−0.501***	−	−0.227***
		(4.55)		(−8.79)		(−3.34)
CM_t * ADJ	−	−0.120	+	0.111	?	−0.010
		(−0.97)		(0.93)		(−0.07)
CM_t * LANG	+	0.360**	0	−0.331**	+	0.029
		(2.06)		(−2.34)		(0.17)
CM_t * RELIG	+	0.060	0	0.156**	+	0.216**
		(0.69)		(2.01)		(2.34)
CM_t * LEGAL	?	0.022	0	−0.122*	?	−0.101
		(0.29)		(−1.78)		(−1.22)
CM_t * COLONY	?	−0.713***	0	0.302**	?	−0.411**
		(−4.11)		(2.22)		(−2.09)
ECU_t	+	−0.030	+	0.471***	+	0.442**
		(−0.16)		(3.25)		(2.42)
ECU_t * ln DIST	−	−0.020	−	−0.240**	−	−0.260*
		(−0.14)		(−2.15)		(−1.75)
ECU_t * ADJ	−	−0.027	+	−0.070	?	−0.097
		(−0.14)		(−0.42)		(−0.52)
ECU_t * LANG	+	0.400**	0	0.011	+	0.411**
		(2.15)		(0.08)		(2.10)
ECU_t * RELIG	+	−0.303**	0	0.650***	+	0.347**
		(−2.21)		(5.21)		(2.31)
ECU_t * LEGAL	?	−0.023	0	−0.152*	?	−0.175*
		(−0.24)		(−1.73)		(−1.77)

(Continued)

Table 2

(1) Variables	(2) Expected Sign Extensive	(3) Extensive	(4) Expected Sign Intensive	(5) Intensive	(6) Expected Sign Trade	(7) Trade
ECU_t * COLONY	?	-0.569^{**}	0	0.487^{**}	?	-0.083
		(-2.01)		(1.96)		(-0.20)
Fixed Effects:						
Exporter-Year		Yes		Yes		Yes
Importer-Year		Yes		Yes		Yes
Country-Pair		Yes		Yes		Yes
R^2		0.810		0.789		0.891
N		99,637		99,637		99,637

Notes: *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. Cutoff for nontraded goods is \$100,000; this affects the sample size. t-statistics are in parentheses.

Table 3

(1) Variables	(2) Expected Sign	(3) Without Lags	(4) With Lags
EIA_t	+	0.262***	0.241***
		(5.14)	(4.57)
EIA_{t-5}	+		0.083
			(1.54)
EIA_t * ln DIST	−	-0.243***	-0.111***
		(-6.03)	(-2.61)
EIA_{t-5} * ln DIST	−		-0.186***
			(-4.78)
EIA_t * ADJ	?	-0.362***	-0.237**
		(-3.35)	(-2.02)
EIA_{t-5} * ADJ	?		-0.191*
			(-1.81)
EIA_t * LANG	+	0.333***	0.315***
		(3.76)	(3.35)
EIA_{t-5} * LANG	+		-0.077
			(-0.83)
EIA_t * RELIG	+	0.313***	0.235***
		(3.71)	(2.63)
EIA_{t-5} * RELIG	+		0.093
			(1.13)
EIA_t * LEGAL	?	-0.132*	-0.084
		(-1.88)	(-1.10)
EIA_{t-5} * LEGAL	?		-0.030
			(-0.43)
EIA_t * COLONY	?	-0.533***	-0.547***
		(-4.01)	(-4.33)
EIA_{t-5} * COLONY	?		-0.022
			(-0.21)
Fixed Effects:			
Exporter-Year		Yes	Yes
Importer-Year		Yes	Yes
Country-Pair		Yes	Yes
R^2		0.840	0.844
N		152,550	144,480

Notes: *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. t-statistics are in parentheses.

Table 4

(1) Variables	(2) Expected Sign Extensive	(3) Extensive	(4) Extensive	(5) Expected Sign Intensive	(6) Intensive	(7) Intensive	(8) Expected Sign Trade	(9) Trade	(10) Trade
EIA_t	+	-0.005	0.046	+	0.239***	0.117***	+	0.233***	0.163***
		(-0.15)	(1.12)		(7.42)	(3.10)		(6.38)	(3.76)
EIA_t * ln DIST	−	-0.072**	-0.053*	−	-0.149***	-0.157***	−	-0.221***	-0.210***
		(-2.48)	(-1.83)		(-5.84)	(-6.08)		(-7.20)	(-6.74)
EIA_t * ADJ	?	-0.240***	-0.291***	+	0.183***	0.230***	−	-0.056	-0.061
		(-2.96)	(-3.60)		(2.80)	(3.55)		(-0.66)	(-0.70)
EIA_t * LANG	+	0.191***	0.145**	0	0.041	0.124**	+	0.232***	0.269***
		(3.00)	(2.27)		(0.75)	(2.27)		(3.50)	(3.96)
EIA_t * RELIG	+	0.054	0.054	0	0.275***	0.216***	+	0.330***	0.271***
		(0.88)	(0.86)		(5.15)	(3.98)		(5.08)	(4.07)
EIA_t * LEGAL	?	-0.111**	-0.160***	0	-0.049	-0.001	?	-0.160***	-0.161***
		(-2.11)	(-2.99)		(-1.13)	(-0.03)		(-2.85)	(-2.84)
EIA_t * COLONY	?	-0.515***	-0.439***	0	0.178*	0.092	?	-0.336***	-0.347***
		(-4.90)	(-4.14)		(1.95)	(0.96)		(-2.70)	(-2.73)
EIA_t * WTO-BOTH$_t$	?		0.132**	−		-0.038	?		0.094
			(2.40)			(-0.70)			(1.51)
EIA_t * DPOLITY$_t$	?		-0.017***	?		0.005	?		-0.012***
			(-4.21)			(1.26)			(-2.75)
EIA_t * Difference in ln PCGDP$_t$	?		0.030	?		-0.073***	?		-0.043
			(1.24)			(-3.25)			(-1.64)
EIA_t * ln Exporter PCGDP$_t$	?		-0.093***	?		0.125***	?		0.032
			(-4.71)			(6.86)			(1.57)
EIA_t * ln Importer PCGDP$_t$	?		-0.068***	?		0.051***	?		-0.018
			(-3.53)			(2.82)			(-0.84)
Fixed Effects:									
Exporter-Year		Yes	Yes		Yes	Yes		Yes	Yes
Importer-Year		Yes	Yes		Yes	Yes		Yes	Yes
Country-pair		Yes	Yes		Yes	Yes		Yes	Yes
R^2		0.819	0.819		0.777	0.777		0.889	0.889
N		83,196	83,196		83,196	83,196		83,196	83,196

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$, respectively. Cutoff for nontraded goods is $100,000; this affects the sample size. t-statistics are in parentheses.

Table 5

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA_t	0.075	0.118	0.102	0.070	0.032	0.040	0.145***	0.150**	0.143**
	(1.18)	(1.56)	(1.35)	(1.17)	(0.45)	(0.57)	(2.88)	(2.48)	(2.36)
EIA_t * ln DIST	0.064	0.127*	0.120	-0.019	-0.064	-0.062	0.044	0.062	0.058
	(0.92)	(1.71)	(1.60)	(-0.30)	(-0.86)	(-0.82)	(0.79)	(1.02)	(0.94)
EIA_t * ADJ	-0.071	-0.196	-0.206	0.017	0.119	0.142	-0.053	-0.077	-0.064
	(-0.47)	(-1.26)	(-1.28)	(0.13)	(0.88)	(1.00)	(-0.43)	(-0.60)	(-0.48)
EIA_t * LANG	-0.176	-0.247*	-0.232*	0.184	0.244**	0.246**	0.009	-0.003	0.013
	(-1.40)	(-1.95)	(-1.83)	(1.64)	(2.17)	(2.14)	(0.09)	(-0.03)	(0.13)
EIA_t * RELIG	0.376***	0.374**	0.328**	-0.117	-0.119	-0.117	0.258**	0.255**	0.212*
	(2.62)	(2.49)	(2.18)	(-0.88)	(-0.84)	(-0.82)	(2.29)	(2.13)	(1.75)
EIA_t * LEGAL	0.141	0.088	0.062	-0.085	-0.051	-0.048	0.056	0.036	0.014
	(1.13)	(0.69)	(0.49)	(-0.80)	(-0.47)	(-0.44)	(0.60)	(0.38)	(0.15)
EIA_t * COLONY	-0.754***	-0.772***	-0.783***	0.255	0.257	0.275	-0.499***	-0.515***	-0.508***
	(-3.11)	(-2.82)	(-3.03)	(1.56)	(1.37)	(1.47)	(-3.03)	(-3.01)	(-3.26)
EIA_t * WTO-BOTH$_t$		0.320**	0.331**		-0.112	-0.114		0.208	0.217
		(2.25)	(2.32)		(-0.87)	(-0.88)		(1.55)	(1.61)
EIA_t * DPOLITY$_t$		-0.013	-0.014		0.005	0.006		-0.008	-0.009
		(-1.39)	(-1.55)		(0.57)	(0.65)		(-0.98)	(-1.08)
EIA_t * Difference ln PCGDP$_t$		-0.004	-0.000		0.019	0.006		0.015	0.006
		(-0.07)	(-0.01)		(0.40)	(0.13)		(0.35)	(0.14)
EIA_t * ln Exporter PCGDP$_t$		-0.166***	-0.176***		0.136***	0.137***		-0.030	-0.039
		(-3.65)	(-3.85)		(3.38)	(3.37)		(-0.84)	(-1.09)
EIA_t * ln Importer PCGDP$_t$		-0.067	-0.053		0.020	0.016		-0.047	-0.037
		(-1.47)	(-1.15)		(0.49)	(0.37)		(-1.24)	(-0.97)
EIA_t * lnTAR$_t$		0.203	0.892**		-0.221	-0.432		-0.018	0.461
		(0.88)	(2.36)		(-0.90)	(-1.16)		(-0.07)	(1.30)
$\ln(t)_t$			-1.416***			0.898***			-0.518*
			(-4.15)			(2.77)			(-1.83)
$\ln(t)_t$ * ln DIST			-0.090			-0.014			-0.105
			(-0.30)			(-0.05)			(-0.48)
$\ln(t)_t$ * ADJ			0.568			-0.020			0.548
			(0.57)			(-0.02)			(0.74)
$\ln(t)_t$ * LANG			0.798			0.013			0.812
			(1.06)			(0.02)			(1.17)
$\ln(t)_t$ * RELIG			-0.938			-0.598			-1.536**
			(-1.16)			(-0.91)			(-2.41)
$\ln(t)_t$ * LEGAL			-0.616			0.148			-0.468
			(-1.42)			(0.39)			(-1.45)
$\ln(t)_t$ * COLONY			0.537			0.387			0.924
			(0.57)			(0.47)			(1.18)
$\ln(t)_t$ * WTO-BOTH$_t$			0.878			-0.401			0.476
			(1.46)			(-0.79)			(1.07)
$\ln(t)_t$ * PDOLITY$_t$			0.058*			-0.036			0.022
			(1.87)			(-1.29)			(0.89)
$\ln(t)_t$ * Difference in ln PCGDP$_t$			-0.036			-0.207			-0.243
			(-0.15)			(-1.02)			(-1.38)
$\ln(t)_t$ * ln Exporter PCGDP$_t$			-0.095			-0.117			-0.212
			(-0.46)			(-0.65)			(-1.30)
$\ln(t)_t$ * ln Importer PCGDP$_t$			-0.204			0.296			0.092
			(-0.52)			(0.82)			(0.33)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.772	0.772	0.772	0.716	0.716	0.716	0.893	0.893	0.893
N	12,892	12,892	12,892	12,892	12,892	12,892	12,892	12,892	12,892

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$, respectively. Cutoff for nontraded goods is $1,000,000; this affects the sample size. t-statistics are in parentheses.

Table 6

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA_t	-0.059	0.050	0.050	0.126**	0.084	0.081	0.067	0.134**	0.130**
	(-1.24)	(0.83)	(0.82)	(2.29)	(1.19)	(1.14)	(1.36)	(2.09)	(2.02)
EIA_t * ln DIST	0.033	0.138***	0.110**	-0.005	-0.055	-0.046	0.028	0.083	0.064
	(0.67)	(2.65)	(2.10)	(-0.09)	(-0.91)	(-0.76)	(0.54)	(1.44)	(1.10)
EIA_t * ADJ	0.010	-0.082	-0.133	-0.126	-0.091	-0.062	-0.116	-0.172	-0.195
	(0.08)	(-0.64)	(-1.01)	(-0.89)	(-0.64)	(-0.42)	(-0.92)	(-1.34)	(-1.45)
EIA_t * LANG	-0.152	-0.180*	-0.157	0.208*	0.218**	0.204*	0.056	0.037	0.046
	(-1.57)	(-1.87)	(-1.58)	(1.91)	(1.99)	(1.82)	(0.58)	(0.38)	(0.46)
EIA_t * RELIG	0.186	0.219*	0.246**	0.061	0.016	-0.028	0.248**	0.235**	0.218*
	(1.62)	(1.86)	(2.06)	(0.49)	(0.13)	(-0.22)	(2.34)	(2.10)	(1.95)
EIA_t * LEGAL	-0.025	-0.081	-0.092	0.053	0.081	0.078	0.027	0.000	-0.014
	(-0.30)	(-0.95)	(-1.06)	(0.57)	(0.84)	(0.80)	(0.30)	(0.00)	(-0.15)
EIA_t * COLONY	-0.206	-0.278	-0.253	-0.183	-0.134	-0.126	-0.389**	-0.411**	-0.378***
	(-1.01)	(-1.16)	(-1.14)	(-1.15)	(-0.75)	(-0.74)	(-2.43)	(-2.45)	(-2.71)
EIA_t * WTO-$BOTH_t$		0.160	0.176		-0.178	-0.187		-0.019	-0.010
		(1.37)	(1.52)		(-1.36)	(-1.43)		(-0.15)	(-0.08)
EIA_t * $DPOLITY_t$		-0.006	-0.005		-0.001	-0.002		-0.007	-0.007
		(-0.92)	(-0.66)		(-0.16)	(-0.28)		(-0.95)	(-0.86)
EIA_t * Difference ln $PCGDP_t$		-0.033	-0.028		0.023	0.019		-0.009	-0.009
		(-0.81)	(-0.70)		(0.51)	(0.42)		(-0.22)	(-0.22)
EIA_t * ln Exporter $PCGDP_t$		-0.055	-0.049		0.015	0.009		-0.040	-0.040
		(-1.56)	(-1.39)		(0.38)	(0.23)		(-1.14)	(-1.14)
EIA_t * ln Importer $PCGDP_t$		-0.186***	-0.191***		0.105***	0.110***		-0.081**	-0.081**
		(-5.38)	(-5.44)		(2.72)	(2.80)		(-2.23)	(-2.19)
EIA_t * $lnTAR_t$		0.124	-0.279		-0.135	0.246		-0.011	-0.033
		(0.57)	(-0.76)		(-0.51)	(0.61)		(-0.04)	(-0.09)
$ln(t)_t$			-0.460			-0.159			-0.619**
			(-1.64)			(-0.57)			(-2.31)
$ln(t)_t$ * ln DIST			-0.876***			0.354			-0.522**
			(-3.56)			(1.35)			(-2.12)
$ln(t)_t$ * ADJ			-1.525			1.150			-0.376
			(-1.63)			(1.31)			(-0.43)
$ln(t)_t$ * LANG			0.383			-0.165			0.218
			(0.57)			(-0.25)			(0.34)
$ln(t)_t$ * RELIG			1.214*			-1.593**			-0.379
			(1.70)			(-2.53)			(-0.71)
$ln(t)_t$ * LEGAL			-0.062			-0.145			-0.207
			(-0.17)			(-0.42)			(-0.62)
$ln(t)_t$ * COLONY			0.429			1.365*			1.794**
			(0.70)			(1.86)			(2.17)
$ln(t)_t$ * WTO-$BOTH_t$			-0.115			0.256			0.142
			(-0.25)			(0.57)			(0.30)
$ln(t)_t$ * $PDOLITY_t$			-0.023			0.023			0.001
			(-0.85)			(0.92)			(0.02)
$ln(t)_t$ * Difference in ln $PCGDP_t$			0.017			-0.004			0.013
			(0.09)			(-0.02)			(0.08)
$ln(t)_t$ * ln Exporter $PCGDP_t$			0.236			-0.197			0.039
			(1.37)			(-1.16)			(0.24)
$ln(t)_t$ * ln Importer $PCGDP_t$			-0.290			0.224			-0.066
			(-1.14)			(0.87)			(-0.25)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.787	0.788	0.788	0.685	0.685	0.686	0.880	0.880	0.880
N	18,720	18,720	18,720	18,720	18,720	18,720	18,720	18,720	18,720

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$, respectively. Cutoff for nontraded goods is $100,000; this affects the sample size. t-statistics are in parentheses.

Table 7

Variables	(1) Expected Sign	(2) Trade>0	(3) Trade≥0
EIA_t	+	0.109***	0.096**
		(2.81)	(2.34)
EIA_t * ln DIST	–	-0.103**	-0.107**
		(-2.49)	(-2.56)
EIA_t * ADJ	?	-0.266***	-0.267***
		(-2.89)	(-2.90)
EIA_t * LANG	+	-0.415***	-0.417***
		(-4.78)	(-4.79)
EIA_t * RELIG	+	0.471***	0.471***
		(4.51)	(4.55)
EIA_t * LEGAL	?	0.107	0.115
		(1.36)	(1.48)
EIA_t * COLONY	?	0.073	0.050
		(0.63)	(0.43)
Fixed Effects:			
Exporter-Year		Yes	Yes
Importer-Year		Yes	Yes
Country-Pair		Yes	Yes
R^2		0.993	0.993
N		152,550	232,358

Notes: Estimation uses PPML. *, **, and *** denote $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively. Cutoff for nontraded goods is $1,000,000; this affects the sample size. t-statistics are in parentheses.

Table 8

Part A: SITC 0									
(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA_t	0.118***	0.133***	0.137***	0.106**	0.036	0.028	0.224***	0.168***	0.165***
	(2.69)	(2.68)	(2.78)	(2.52)	(0.75)	(0.59)	(5.31)	(3.44)	(3.41)
EIA_t * ln DIST	0.181***	0.173***	0.195***	-0.171***	-0.246***	-0.247***	0.010	-0.073	-0.052
	(3.03)	(2.66)	(2.91)	(-3.13)	(-4.27)	(-4.20)	(0.19)	(-1.29)	(-0.90)
EIA_t * ADJ	0.315***	0.199*	0.248**	0.138	0.234**	0.205*	0.453***	0.432***	0.453***
	(2.88)	(1.79)	(2.19)	(1.18)	(1.97)	(1.68)	(3.66)	(3.36)	(3.46)
EIA_t * LANG	0.173**	0.145*	0.191**	-0.023	-0.002	-0.055	0.150	0.143	0.135
	(1.97)	(1.65)	(2.14)	(-0.26)	(-0.02)	(-0.59)	(1.63)	(1.52)	(1.43)
EIA_t * RELIG	0.157	-0.018	-0.046	-0.197*	-0.206*	-0.143	-0.040	-0.224*	-0.189
	(1.45)	(-0.16)	(-0.39)	(-1.75)	(-1.68)	(-1.16)	(-0.33)	(-1.68)	(-1.41)
EIA_t * LEGAL	0.007	-0.074	-0.094	-0.045	-0.025	-0.032	-0.037	-0.099	-0.126
	(0.10)	(-0.94)	(-1.14)	(-0.57)	(-0.31)	(-0.39)	(-0.47)	(-1.25)	(-1.56)
EIA_t * COLONY	-0.206	-0.222	-0.194	0.239	0.296	0.342	0.033	0.073	0.148
	(-0.72)	(-0.76)	(-0.67)	(0.87)	(1.08)	(1.20)	(0.14)	(0.30)	(0.61)
EIA_t * WTO-$BOTH_t$		0.089	0.072		-0.088	-0.069		0.000	0.003
		(0.77)	(0.62)		(-0.98)	(-0.77)		(0.00)	(0.03)
EIA_t * $DPOLITY_t$		-0.023***	-0.023***		0.005	0.004		-0.019***	-0.018***
		(-3.65)	(-3.57)		(0.77)	(0.73)		(-2.89)	(-2.86)
EIA_t * Difference in ln $PCGDP_t$		-0.081**	-0.080**		-0.022	-0.034		-0.103***	-0.114***
		(-2.21)	(-2.17)		(-0.62)	(-0.96)		(-2.94)	(-3.26)
EIA_t * ln Exporter $PCGDP_t$		-0.079**	-0.087***		0.117***	0.109***		0.039	0.022
		(-2.45)	(-2.70)		(3.87)	(3.56)		(1.30)	(0.74)
EIA_t * ln Importer $PCGDP_t$		-0.032	-0.033		0.084***	0.085***		0.052*	0.052*
		(-1.02)	(-1.04)		(2.83)	(2.78)		(1.71)	(1.69)
EIA_t * $\ln(TAR_0)_t$		-0.121	0.099		0.010	0.194		-0.111	0.293
		(-0.64)	(0.33)		(0.05)	(0.61)		(-0.74)	(1.14)
$\ln(t_0)_t$			-0.231			0.074			-0.157
			(-1.14)			(0.34)			(-0.84)
$\ln(t_0)_t$ * ln DIST			0.019			0.161			0.180
			(0.11)			(0.83)			(1.06)
$\ln(t_0)_t$ * ADJ			0.200			-0.216			-0.016
			(0.49)			(-0.55)			(-0.05)
$\ln(t_0)_t$ * LANG			0.375			-1.116***			-0.741*
			(0.97)			(-3.18)			(-1.96)
$\ln(t_0)_t$ * RELIG			-1.107**			1.321***			0.214
			(-2.33)			(2.89)			(0.53)
$\ln(t_0)_t$ * LEGAL			0.120			-0.433			-0.313
			(0.38)			(-1.43)			(-1.12)
$\ln(t_0)_t$ * COLONY			1.173			0.000			1.173
			(1.44)			(0.00)			(1.59)
$\ln(t_0)_t$ * WTO-$BOTH_t$			-0.489*			0.216			-0.273
			(-1.92)			(0.86)			(-1.13)
$\ln(t_0)_t$ * $DPOLITY_t$			-0.105***			0.049**			-0.056***
			(-5.09)			(2.41)			(-3.26)
$\ln(t_0)_t$ * Difference in ln $PCGDP_t$			0.079			-0.351***			-0.271***
			(0.69)			(-3.00)			(-2.65)
$\ln(t_0)_t$ * ln Exporter $PCGDP_t$			-0.066			-0.177*			-0.243***
			(-0.72)			(-1.84)			(-3.06)

$\ln(t_0)_t$ * ln Importer $PCGDP_t$			0.214			0.042			0.256^{**}
			(1.63)			(0.29)			(2.04)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.848	0.848	0.849	0.874	0.874	0.875	0.921	0.921	0.922
N	16,746	16,746	16,746	16,746	16,746	16,746	16,746	16,746	16,746

Part B: SITC 1

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA_t	-0.105	-0.147	-0.158^{*}	0.074	0.123	0.131	-0.030	-0.024	-0.027
	(-1.28)	(-1.61)	(-1.75)	(0.96)	(1.44)	(1.55)	(-0.44)	(-0.31)	(-0.35)
EIA_t * ln DIST	-0.026	-0.081	-0.072	0.175^{*}	0.163	0.158	0.149	0.082	0.085
	(-0.25)	(-0.68)	(-0.62)	(1.84)	(1.59)	(1.55)	(1.43)	(0.71)	(0.74)
EIA_t * ADJ	0.302	0.324	0.328	-0.137	-0.142	-0.159	0.165	0.182	0.169
	(1.48)	(1.50)	(1.52)	(-0.78)	(-0.78)	(-0.86)	(0.90)	(0.99)	(0.93)
EIA_t * LANG	0.321^{**}	0.317^{**}	0.307^{**}	-0.384^{***}	-0.380^{***}	-0.411^{***}	-0.063	-0.064	-0.104
	(2.19)	(2.15)	(2.11)	(-2.82)	(-2.76)	(-3.05)	(-0.42)	(-0.43)	(-0.70)
EIA_t * RELIG	0.988^{***}	0.914^{***}	0.913^{***}	-0.508^{***}	-0.479^{**}	-0.437^{**}	0.480^{**}	0.435^{**}	0.476^{**}
	(4.29)	(3.62)	(3.65)	(-2.59)	(-2.32)	(-2.12)	(2.52)	(2.04)	(2.22)
EIA_t * LEGAL	0.044	0.060	0.118	0.040	0.081	0.013	0.083	0.142	0.130
	(0.26)	(0.34)	(0.66)	(0.30)	(0.60)	(0.09)	(0.59)	(1.01)	(0.90)
EIA_t * COLONY	-0.996^{***}	-1.001^{***}	-1.160^{***}	-0.089	-0.122	0.267	-1.085^{***}	-1.123^{***}	-0.893^{***}
	(-4.75)	(-4.73)	(-4.94)	(-0.38)	(-0.52)	(1.13)	(-6.39)	(-6.55)	(-4.55)
EIA_t * WTO-$BOTH_t$		0.374	0.398^{*}		-0.575^{**}	-0.618^{**}		-0.201	-0.220
		(1.61)	(1.70)		(-2.27)	(-2.48)		(-0.74)	(-0.84)
EIA_t * $DPOLITY_t$		-0.006	-0.004		0.016	0.013		0.011	0.010
		(-0.49)	(-0.31)		(1.41)	(1.14)		(0.92)	(0.84)
EIA_t * Difference in ln $PCGDP_t$		0.018	0.028		-0.008	-0.012		0.011	0.016
		(0.25)	(0.39)		(-0.11)	(-0.17)		(0.17)	(0.25)
EIA_t * ln Exporter $PCGDP_t$		0.082	0.094		0.045	0.034		0.128^{**}	0.129^{**}
		(1.37)	(1.58)		(0.65)	(0.50)		(1.98)	(2.02)
EIA_t * ln Importer $PCGDP_t$		0.049	0.030		-0.006	0.008		0.043	0.038
		(0.77)	(0.47)		(-0.11)	(0.14)		(0.86)	(0.72)
EIA_t * $\ln(TAR_1)_t$		-0.069	-0.448		0.013	0.057		-0.055	-0.392
		(-0.86)	(-1.55)		(0.17)	(0.19)		(-0.72)	(-1.38)
$\ln(t_1)_t$			0.299^{*}			-0.019			0.279
			(1.72)			(-0.09)			(1.62)
$\ln(t_1)_t$ * ln DIST			-0.187			0.139			-0.048
			(-1.30)			(0.95)			(-0.34)
$\ln(t_1)_t$ * ADJ			-0.554^{**}			0.326			-0.227
			(-2.08)			(1.11)			(-0.77)
$\ln(t_1)_t$ * LANG			-0.146			-0.813^{***}			-0.959^{***}
			(-0.56)			(-2.61)			(-3.32)
$\ln(t_1)_t$ * RELIG			0.090			1.328^{***}			1.418^{***}
			(0.29)			(3.89)			(4.69)
$\ln(t_1)_t$ * LEGAL			0.041			0.272			0.313^{*}
			(0.22)			(1.32)			(1.76)
$\ln(t_1)_t$ * COLONY			0.456^{*}			-0.093			0.363
			(1.74)			(-0.34)			(1.48)
$\ln(t_1)_t$ * WTO-$BOTH_t$			0.007			0.146			0.153

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			(0.03)			(0.56)			(0.61)
$\ln(t_1)_t$ * $DPOLITY_t$			-0.053***			0.055**			0.002
			(-3.09)			(2.56)			(0.10)
$\ln(t_1)_t$ * Difference in ln $PCGDP_t$			-0.115			0.446***			0.331**
			(-1.07)			(3.14)			(2.35)
$\ln(t_1)_t$ * ln Exporter $PCGDP_t$			-0.051			-0.121			-0.172*
			(-0.60)			(-1.19)			(-1.69)
$\ln(t_1)_t$ * ln Importer $PCGDP_t$			-0.006			-0.017			-0.023
			(-0.07)			(-0.14)			(-0.21)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.847	0.847	0.847	0.917	0.917	0.918	0.944	0.944	0.945
N	5,448	5,448	5,448	5,448	5,448	5,448	5,448	5,448	5,448

Part C: SITC 2

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA_t	-0.010	0.030	-0.005	0.163***	0.099*	0.103*	0.152***	0.128**	0.098*
	(-0.19)	(0.50)	(-0.08)	(3.63)	(1.85)	(1.93)	(3.32)	(2.44)	(1.87)
EIA_t * ln DIST	0.001	0.073	0.104	0.059	-0.018	-0.032	0.060	0.055	0.072
	(0.01)	(1.02)	(1.44)	(1.02)	(-0.27)	(-0.49)	(1.08)	(0.93)	(1.20)
EIA_t * ADJ	0.240	0.213	0.208	-0.037	0.061	0.142	0.203	0.274**	0.350***
	(1.61)	(1.39)	(1.32)	(-0.32)	(0.51)	(1.14)	(1.62)	(2.13)	(2.62)
EIA_t * LANG	-0.201*	-0.172	-0.126	0.301***	0.318***	0.311***	0.100	0.146	0.185*
	(-1.71)	(-1.41)	(-1.05)	(3.18)	(3.40)	(3.30)	(0.96)	(1.37)	(1.73)
EIA_t * RELIG	-0.374***	-0.319**	-0.328**	0.364***	0.332***	0.309**	-0.010	0.013	-0.020
	(-2.82)	(-2.37)	(-2.45)	(3.09)	(2.71)	(2.52)	(-0.09)	(0.10)	(-0.16)
EIA_t * LEGAL	-0.089	-0.097	-0.104	-0.020	-0.012	0.008	-0.109	-0.109	-0.096
	(-0.81)	(-0.90)	(-0.95)	(-0.22)	(-0.13)	(0.08)	(-1.20)	(-1.19)	(-1.05)
EIA_t * COLONY	1.270***	1.105***	0.861**	-0.115	0.054	0.115	1.155***	1.159***	0.977***
	(3.37)	(2.94)	(2.47)	(-0.50)	(0.24)	(0.50)	(4.03)	(4.06)	(3.48)
EIA_t * WTO-$BOTH_t$		0.116	0.103		-0.211	-0.211		-0.095	-0.108
		(0.89)	(0.79)		(-1.59)	(-1.59)		(-0.80)	(-0.91)
EIA_t * $DPOLITY_t$		-0.007	-0.009		0.011*	0.011*		0.004	0.002
		(-0.97)	(-1.20)		(1.72)	(1.75)		(0.58)	(0.35)
EIA_t * Difference in ln $PCGDP_t$		0.032	0.030		-0.033	-0.032		-0.001	-0.002
		(0.70)	(0.65)		(-0.82)	(-0.78)		(-0.03)	(-0.05)
EIA_t * ln Exporter $PCGDP_t$		0.031	0.027		0.049	0.049		0.079**	0.076**
		(0.78)	(0.69)		(1.42)	(1.43)		(2.34)	(2.26)
EIA_t * ln Importer $PCGDP_t$		-0.185***	-0.171***		0.177***	0.177***		-0.008	0.006
		(-4.58)	(-4.24)		(4.87)	(4.80)		(-0.22)	(0.15)
EIA_t * $\ln(TAR_2)_t$		1.004**	2.222***		-0.516	-0.771		0.489	1.450**
		(2.42)	(3.31)		(-1.59)	(-1.33)		(1.15)	(2.44)
$\ln(t_2)_t$			-0.146			-0.441			-0.587
			(-0.32)			(-1.17)			(-1.57)
$\ln(t_2)_t$ * ln DIST			1.189***			-0.373			0.816**
			(2.67)			(-0.95)			(2.23)
$\ln(t_2)_t$ * ADJ			-0.176			2.028**			1.852*
			(-0.13)			(2.19)			(1.74)
$\ln(t_2)_t$ * LANG			0.805			0.905			1.710**
			(0.95)			(1.30)			(2.29)

$\ln(t_2)_t$ * RELIG			-0.862			-1.560**			-2.422***
			(-1.09)			(-2.07)			(-3.64)
$\ln(t_2)_t$ * LEGAL			0.576			0.487			1.064**
			(0.94)			(0.79)			(2.08)
$\ln(t_2)_t$ * COLONY			-3.372***			0.417			-2.955***
			(-2.75)			(0.37)			(-3.49)
$\ln(t_2)_t$ * WTO-BOTH$_t$			-0.620			1.044*			0.425
			(-0.90)			(1.84)			(0.78)
$\ln(t_2)_t$ * DPOLITY$_t$			0.036			-0.003			0.033
			(0.77)			(-0.06)			(0.94)
$\ln(t_2)_t$ * Difference in ln PCGDP$_t$			0.720***			-0.570**			0.151
			(2.80)			(-2.54)			(0.82)
$\ln(t_2)_t$ * ln Exporter PCGDP$_t$			-0.658***			0.011			-0.647***
			(-3.19)			(0.06)			(-4.38)
$\ln(t_2)_t$ * ln Importer PCGDP$_t$			-0.096			0.220			0.123
			(-0.25)			(0.72)			(0.44)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.832	0.832	0.833	0.877	0.877	0.877	0.925	0.925	0.926
N	13,224	13,224	13,224	13,224	13,224	13,224	13,224	13,224	13,224

Part D: SITC 3

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA$_t$	1.047	1.134	1.060	-0.416	-0.013	-0.038	0.631	1.121*	1.022
	(1.50)	(1.55)	(1.44)	(-0.66)	(-0.02)	(-0.06)	(1.03)	(1.76)	(1.59)
EIA$_t$ * ln DIST	-0.003	-0.086	-0.103	-0.284**	-0.179	-0.189	-0.287**	-0.265*	-0.292**
	(-0.02)	(-0.48)	(-0.57)	(-2.05)	(-1.24)	(-1.30)	(-2.10)	(-1.87)	(-2.01)
EIA$_t$ * ADJ	-0.234	-0.308	-0.284	-0.501**	-0.699***	-0.813***	-0.734**	-1.007***	-1.097***
	(-0.83)	(-1.12)	(-1.03)	(-2.33)	(-3.34)	(-3.78)	(-2.52)	(-3.60)	(-3.82)
EIA$_t$ * LANG	-0.281	-0.241	-0.213	-0.463**	-0.427**	-0.506***	-0.744***	-0.668***	-0.719***
	(-1.19)	(-1.03)	(-0.88)	(-2.44)	(-2.29)	(-2.65)	(-3.68)	(-3.39)	(-3.51)
EIA$_t$ * RELIG	0.029	-0.249	-0.274	0.615**	0.641**	0.629**	0.644**	0.392	0.355
	(0.09)	(-0.79)	(-0.87)	(2.16)	(2.40)	(2.33)	(2.31)	(1.32)	(1.19)
EIA$_t$ * LEGAL	0.576***	0.441**	0.396*	0.089	0.089	0.188	0.665***	0.530***	0.583***
	(2.63)	(1.96)	(1.75)	(0.48)	(0.46)	(0.95)	(3.23)	(2.60)	(2.82)
EIA$_t$ * COLONY	18.058	20.711	19.670	-12.335	-2.644	-3.706	5.723	18.066	15.965
	(0.89)	(0.97)	(0.92)	(-0.67)	(-0.14)	(-0.20)	(0.32)	(0.98)	(0.86)
EIA$_t$ * WTO-BOTH$_t$		-0.274	-0.166		-0.350	-0.426**		-0.624***	-0.592**
		(-1.33)	(-0.80)		(-1.62)	(-2.02)		(-2.62)	(-2.53)
EIA$_t$ * DPOLITY$_t$		-0.031*	-0.030*		-0.022	-0.024*		-0.052***	-0.054***
		(-1.93)	(-1.86)		(-1.56)	(-1.72)		(-3.65)	(-3.69)
EIA$_t$ * Difference in ln PCGDP$_t$		-0.177*	-0.182*		-0.023	-0.037		-0.200**	-0.219***
		(-1.90)	(-1.95)		(-0.27)	(-0.44)		(-2.37)	(-2.59)
EIA$_t$ * ln Exporter PCGDP$_t$		0.137	0.128		-0.082	-0.078		0.056	0.050
		(1.32)	(1.21)		(-0.93)	(-0.89)		(0.64)	(0.57)
EIA$_t$ * ln Importer PCGDP$_t$		0.011	0.043		-0.151**	-0.167**		-0.140*	-0.124
		(0.12)	(0.47)		(-2.04)	(-2.26)		(-1.80)	(-1.58)
EIA$_t$ * $\ln(TAR_3)_t$		0.612	2.515*		0.274	-0.726		0.886	1.788
		(0.75)	(1.72)		(0.38)	(-0.58)		(1.17)	(1.35)
$\ln(t_3)_t$			-2.772**			2.132**			-0.640

(1) Variables	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			(-2.41)			(2.02)			(-0.59)
$\ln(t_3)_t$ * ln DIST			-0.847			0.569			-0.278
			(-1.11)			(0.82)			(-0.40)
$\ln(t_3)_t$ * ADJ			-1.094			-1.950			-3.044**
			(-0.83)			(-1.48)			(-2.00)
$\ln(t_3)_t$ * LANG			-1.709			-0.767			-2.476*
			(-1.23)			(-0.59)			(-1.75)
$\ln(t_3)_t$ * RELIG			-1.283			0.143			-1.140
			(-0.90)			(0.10)			(-0.76)
$\ln(t_3)_t$ * LEGAL			-1.149			3.055***			1.906
			(-0.92)			(2.72)			(1.62)
$\ln(t_3)_t$ * COLONY			1.185			-2.321			-1.135
			(0.49)			(-1.01)			(-0.48)
$\ln(t_3)_t$ * WTO-BOTH$_t$			-2.930***			1.899*			-1.031
			(-2.73)			(1.92)			(-0.97)
$\ln(t_3)_t$ * DPOLITY$_t$			-0.181**			0.075			-0.106
			(-2.08)			(0.98)			(-1.26)
$\ln(t_3)_t$ * Difference in ln PCGDP$_t$			0.295			-0.892*			-0.597
			(0.57)			(-1.74)			(-1.11)
$\ln(t_3)_t$ * ln Exporter PCGDP$_t$			-0.082			-0.376			-0.458
			(-0.17)			(-0.79)			(-0.85)
$\ln(t_3)_t$ * ln Importer PCGDP$_t$			-0.894			0.754			-0.140
			(-1.32)			(1.18)			(-0.19)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.845	0.845	0.846	0.865	0.866	0.866	0.909	0.910	0.910
N	6,352	6,352	6,352	6,352	6,352	6,352	6,352	6,352	6,352

Part E: SITC 4

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables		Extensive			Intensive			Trade	
EIA$_t$	-0.066	-0.208*	-0.231*	0.072	0.112	0.147	0.006	-0.096	-0.084
	(-0.71)	(-1.74)	(-1.87)	(0.88)	(1.19)	(1.52)	(0.06)	(-0.89)	(-0.77)
EIA$_t$ * ln DIST	0.249**	0.300**	0.373**	0.051	-0.011	-0.077	0.300**	0.289**	0.295**
	(1.97)	(2.02)	(2.45)	(0.43)	(-0.08)	(-0.54)	(2.50)	(2.07)	(2.03)
EIA$_t$ * ADJ	0.646**	0.780***	0.885***	0.075	0.021	-0.052	0.722***	0.801***	0.833***
	(2.21)	(2.68)	(2.99)	(0.31)	(0.09)	(-0.20)	(2.86)	(3.01)	(3.09)
EIA$_t$ * LANG	0.163	0.134	0.234	0.326*	0.332*	0.204	0.489***	0.466**	0.438**
	(0.74)	(0.60)	(1.05)	(1.79)	(1.74)	(1.07)	(2.61)	(2.43)	(2.24)
EIA$_t$ * RELIG	-0.166	-0.091	-0.146	0.350	0.255	0.221	0.184	0.164	0.075
	(-0.57)	(-0.30)	(-0.49)	(1.19)	(0.85)	(0.72)	(0.58)	(0.51)	(0.24)
EIA$_t$ * LEGAL	-0.363**	-0.295	-0.355*	-0.326**	-0.436**	-0.302	-0.689***	-0.730***	-0.657***
	(-1.98)	(-1.55)	(-1.84)	(-2.01)	(-2.30)	(-1.58)	(-4.25)	(-3.97)	(-3.61)
EIA$_t$ * COLONY	0.926*	1.004*	1.032**	-0.403	-0.392	-0.394	0.523	0.611	0.639
	(1.75)	(1.86)	(2.00)	(-1.15)	(-1.08)	(-1.07)	(1.00)	(1.16)	(1.22)
EIA$_t$ * WTO-BOTH$_t$		0.497	0.560		-0.063	-0.036		0.435	0.524
		(1.37)	(1.48)		(-0.23)	(-0.13)		(1.39)	(1.63)
EIA$_t$ * DPOLITY$_t$		0.017	0.013		-0.004	-0.002		0.013	0.011
		(1.02)	(0.77)		(-0.27)	(-0.15)		(0.90)	(0.72)
EIA$_t$ * Difference in ln PCGDP$_t$		0.121	0.176*		-0.153	-0.111		-0.032	0.065
		(1.20)	(1.73)		(-1.63)	(-1.16)		(-0.31)	(0.64)

EIA$_t$ * ln Exporter PCGDP$_t$		-0.111	-0.096		0.084	0.096		-0.027	-0.000
		(-1.22)	(-1.08)		(0.99)	(1.14)		(-0.31)	(-0.00)
EIA$_t$ * ln Importer PCGDP$_t$		0.148*	0.187**		-0.049	-0.034		0.099	0.153**
		(1.87)	(2.30)		(-0.70)	(-0.48)		(1.29)	(1.99)
EIA$_t$ * ln(TAR$_4$)$_t$		0.557	1.466*		0.206	0.787		0.763*	2.253***
		(1.19)	(1.77)		(0.51)	(0.96)		(1.80)	(2.74)
ln(t$_4$)$_t$			-0.042			-0.025			-0.068
			(-0.06)			(-0.04)			(-0.11)
ln(t$_4$)$_t$ * ln DIST			0.769**			-0.524			0.245
			(1.99)			(-1.55)			(0.67)
ln(t$_4$)$_t$ * ADJ			1.395			-0.675			0.721
			(1.49)			(-0.81)			(0.82)
ln(t$_4$)$_t$ * LANG			0.765			-2.338***			-1.574**
			(0.92)			(-2.92)			(-2.14)
ln(t$_4$)$_t$ * RELIG			-0.794			-1.451*			-2.245***
			(-0.98)			(-1.79)			(-2.74)
ln(t$_4$)$_t$ * LEGAL			-0.875			1.359**			0.485
			(-1.26)			(2.22)			(0.85)
ln(t$_4$)$_t$ * COLONY			3.433*			-1.896			1.537
			(1.93)			(-1.27)			(1.15)
ln(t$_4$)$_t$ * WTO-BOTH$_t$			0.089			-0.045			0.044
			(0.10)			(-0.06)			(0.05)
ln(t$_4$)$_t$ * DPOLITY$_t$			-0.171***			0.015			-0.156***
			(-3.12)			(0.28)			(-2.65)
ln(t$_4$)$_t$ * Difference in ln PCGDP$_t$			1.105**			-0.003			1.102**
			(2.28)			(-0.01)			(2.48)
ln(t$_4$)$_t$ * ln Exporter PCGDP$_t$			-0.389			0.625**			0.235
			(-1.07)			(2.02)			(0.68)
ln(t$_4$)$_t$ * ln Importer PCGDP$_t$			0.737*			-0.915***			-0.178
			(1.72)			(-2.77)			(-0.43)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.862	0.863	0.865	0.841	0.841	0.844	0.908	0.908	0.912
N	3,968	3,968	3,968	3,968	3,968	3,968	3,968	3,968	3,968

Part F: SITC 5

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA$_t$	-0.024	-0.044	-0.074	0.119***	0.163***	0.175***	0.096***	0.119***	0.101***
	(-0.52)	(-0.89)	(-1.47)	(2.59)	(3.34)	(3.57)	(2.82)	(3.09)	(2.58)
EIA$_t$ * ln DIST	-0.047	0.007	-0.029	0.114**	0.092	0.125**	0.067	0.099**	0.096**
	(-0.86)	(0.12)	(-0.46)	(2.03)	(1.47)	(1.97)	(1.62)	(2.17)	(2.06)
EIA$_t$ * ADJ	-0.377***	-0.423***	-0.402***	0.381***	0.482***	0.506***	0.003	0.059	0.104
	(-2.96)	(-3.20)	(-3.06)	(3.16)	(4.01)	(4.06)	(0.03)	(0.60)	(1.02)
EIA$_t$ * LANG	-0.246**	-0.277**	-0.257**	0.366***	0.442***	0.463***	0.119*	0.164**	0.206***
	(-2.19)	(-2.47)	(-2.26)	(3.40)	(4.17)	(4.33)	(1.71)	(2.32)	(2.85)
EIA$_t$ * RELIG	0.167	0.213*	0.127	-0.108	-0.131	-0.105	0.059	0.081	0.022
	(1.44)	(1.82)	(1.08)	(-0.91)	(-1.11)	(-0.88)	(0.67)	(0.91)	(0.24)
EIA$_t$ * LEGAL	-0.033	-0.044	-0.066	-0.072	-0.015	-0.026	-0.105*	-0.059	-0.092
	(-0.34)	(-0.45)	(-0.67)	(-0.75)	(-0.16)	(-0.27)	(-1.70)	(-0.95)	(-1.43)
EIA$_t$ * COLONY	-0.122	-0.105	-0.077	0.247**	0.171	0.228	0.125	0.066	0.151

	(-0.86)	(-0.74)	(-0.52)	(2.14)	(1.24)	(1.59)	(0.90)	(0.45)	(0.98)
EIA_t * WTO-$BOTH_t$		0.383***	0.409***		-0.289***	-0.300***		0.094	0.109
		(3.45)	(3.55)		(-3.02)	(-3.01)		(1.01)	(1.13)
EIA_t * $DPOLITY_t$		-0.005	-0.008		0.006	0.006		0.000	-0.001
		(-0.88)	(-1.27)		(0.85)	(0.95)		(0.04)	(-0.29)
EIA_t * Difference in ln $PCGDP_t$		0.069	0.053		-0.007	0.007		0.062*	0.060*
		(1.52)	(1.18)		(-0.15)	(0.15)		(1.94)	(1.87)
EIA_t * ln Exporter $PCGDP_t$		-0.169***	-0.165***		0.247***	0.236***		0.078***	0.072**
		(-4.11)	(-3.95)		(6.01)	(5.66)		(2.75)	(2.53)
EIA_t * ln Importer $PCGDP_t$		-0.006	0.030		-0.073**	-0.089**		-0.079***	-0.059**
		(-0.15)	(0.81)		(-1.98)	(-2.36)		(-2.99)	(-2.16)
EIA_t * $\ln(TAR_5)_t$		0.893***	2.834***		-1.151***	-1.589**		-0.258	1.245**
		(2.86)	(5.02)		(-3.73)	(-2.48)		(-1.11)	(2.39)
$\ln(t_5)_t$			-2.963***			1.031*			-1.931***
			(-6.40)			(1.93)			(-4.49)
$\ln(t_5)_t$ * ln DIST			-1.209***			1.133***			-0.076
			(-3.99)			(3.55)			(-0.34)
$\ln(t_5)_t$ * ADJ			0.202			0.878			1.080
			(0.27)			(1.05)			(1.41)
$\ln(t_5)_t$ * LANG			0.580			0.475			1.055**
			(0.87)			(0.74)			(2.08)
$\ln(t_5)_t$ * RELIG			-1.752***			0.602			-1.150**
			(-2.64)			(1.03)			(-2.30)
$\ln(t_5)_t$ * LEGAL			-0.051			-0.365			-0.416
			(-0.12)			(-0.79)			(-1.15)
$\ln(t_5)_t$ * COLONY			0.289			1.224			1.512**
			(0.32)			(1.31)			(2.40)
$\ln(t_5)_t$ * WTO-$BOTH_t$			-0.591			1.192**			0.601
			(-1.23)			(2.51)			(1.30)
$\ln(t_5)_t$ * $DPOLITY_t$			0.032			-0.010			0.022
			(1.01)			(-0.31)			(0.80)
$\ln(t_5)_t$ * Difference in ln $PCGDP_t$			-0.398*			0.395*			-0.003
			(-1.73)			(1.69)			(-0.01)
$\ln(t_5)_t$ * ln Exporter $PCGDP_t$			0.075			-0.165			-0.090
			(0.34)			(-0.70)			(-0.48)
$\ln(t_5)_t$ * ln Importer $PCGDP_t$			0.944***			-0.946***			-0.002
			(3.32)			(-3.01)			(-0.01)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.856	0.856	0.858	0.849	0.850	0.851	0.939	0.939	0.939
N	16,760	16,760	16,760	16,760	16,760	16,760	16,760	16,760	16,760

Part G: SITC 6

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA_t	0.083*	-0.013	-0.018	0.175***	0.194***	0.196***	0.259***	0.181***	0.178***
	(1.87)	(-0.26)	(-0.36)	(3.92)	(4.13)	(4.19)	(6.51)	(4.21)	(4.15)
EIA_t * ln DIST	-0.014	-0.101	-0.117*	-0.009	0.021	0.025	-0.023	-0.079	-0.092*
	(-0.24)	(-1.55)	(-1.79)	(-0.16)	(0.35)	(0.42)	(-0.49)	(-1.59)	(-1.81)
EIA_t * ADJ	-0.129	-0.152	-0.158	0.177*	0.183*	0.228**	0.049	0.030	0.070
	(-0.97)	(-1.16)	(-1.19)	(1.68)	(1.74)	(2.14)	(0.48)	(0.30)	(0.67)

EIA_t * LANG	0.129	0.091	0.032	-0.246***	-0.239***	-0.180**	-0.117	-0.148*	-0.149*
	(1.33)	(0.94)	(0.32)	(-2.84)	(-2.73)	(-2.03)	(-1.51)	(-1.87)	(-1.85)
EIA_t * RELIG	0.168	0.036	0.038	-0.024	-0.009	-0.037	0.144	0.028	0.001
	(1.35)	(0.28)	(0.29)	(-0.21)	(-0.08)	(-0.31)	(1.48)	(0.28)	(0.01)
EIA_t * LEGAL	0.047	-0.028	-0.003	0.059	0.075	0.030	0.106	0.047	0.027
	(0.54)	(-0.31)	(-0.03)	(0.72)	(0.90)	(0.35)	(1.49)	(0.65)	(0.37)
EIA_t * COLONY	-0.844***	-0.803***	-0.788***	0.569***	0.535***	0.658***	-0.275**	-0.268**	-0.130
	(-4.97)	(-4.70)	(-4.49)	(3.93)	(3.67)	(4.27)	(-2.30)	(-2.25)	(-1.14)
EIA_t * WTO-$BOTH_t$		0.290***	0.291***		0.074	0.085		0.364***	0.375***
		(2.58)	(2.60)		(0.74)	(0.85)		(3.85)	(3.99)
EIA_t * $DPOLITY_t$		-0.016**	-0.018***		-0.002	0.001		-0.017***	-0.018***
		(-2.48)	(-2.85)		(-0.26)	(0.09)		(-3.12)	(-3.15)
EIA_t * Difference in ln $PCGDP_t$		-0.128***	-0.126***		0.044	0.030		-0.084**	-0.096***
		(-3.01)	(-2.95)		(1.13)	(0.78)		(-2.40)	(-2.71)
EIA_t * ln Exporter $PCGDP_t$		0.020	0.018		0.009	0.008		0.030	0.026
		(0.47)	(0.42)		(0.26)	(0.21)		(0.98)	(0.84)
EIA_t * ln Importer $PCGDP_t$		0.047	0.080**		-0.058*	-0.083**		-0.011	-0.004
		(1.37)	(2.23)		(-1.83)	(-2.51)		(-0.39)	(-0.12)
EIA_t * $\ln(TAR_6)_t$		-0.004	1.133**		-0.165	-0.994**		-0.169	0.139
		(-0.02)	(2.37)		(-0.73)	(-2.23)		(-0.83)	(0.34)
$\ln(t_6)_t$			-1.548***			0.926**			-0.622*
			(-3.57)			(2.32)			(-1.66)
$\ln(t_6)_t$ * ln DIST			-0.685***			0.395			-0.290
			(-2.76)			(1.62)			(-1.29)
$\ln(t_6)_t$ * ADJ			-0.003			0.660			0.657
			(-0.01)			(1.45)			(1.40)
$\ln(t_6)_t$ * LANG			-1.114**			1.313***			0.199
			(-2.32)			(2.89)			(0.50)
$\ln(t_6)_t$ * RELIG			0.041			-1.154**			-1.113***
			(0.08)			(-2.48)			(-2.75)
$\ln(t_6)_t$ * LEGAL			0.417			-0.764**			-0.346
			(1.09)			(-2.06)			(-1.08)
$\ln(t_6)_t$ * COLONY			-0.302			1.931***			1.629***
			(-0.38)			(2.89)			(3.29)
$\ln(t_6)_t$ * WTO-$BOTH_t$			0.101			0.088			0.188
			(0.25)			(0.24)			(0.55)
$\ln(t_6)_t$ * $DPOLITY_t$			0.036			-0.048*			-0.012
			(1.41)			(-1.79)			(-0.54)
$\ln(t_6)_t$ * Difference in ln $PCGDP_t$			0.087			-0.447***			-0.360**
			(0.45)			(-2.87)			(-2.41)
$\ln(t_6)_t$ * ln Exporter $PCGDP_t$			-0.319*			0.327**			0.008
			(-1.72)			(2.13)			(0.05)
$\ln(t_6)_t$ * ln Importer $PCGDP_t$			0.631***			-0.442**			0.190
			(2.77)			(-2.06)			(1.01)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.847	0.847	0.847	0.844	0.844	0.844	0.931	0.931	0.931
N	17,888	17,888	17,888	17,888	17,888	17,888	17,888	17,888	17,888

Part H: SITC 7

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Variables	Extensive			Intensive			Trade		
EIA_t	-0.215***	-0.216***	-0.214***	0.288***	0.308***	0.299***	0.073*	0.092*	0.084*
	(-3.96)	(-3.41)	(-3.37)	(6.28)	(5.74)	(5.56)	(1.70)	(1.84)	(1.70)
EIA_t * ln DIST	0.052	0.044	0.000	0.059	0.065	0.097	0.111**	0.108*	0.097
	(0.72)	(0.56)	(0.00)	(0.97)	(0.99)	(1.44)	(1.99)	(1.86)	(1.63)
EIA_t * ADJ	-0.392***	-0.519***	-0.529***	0.326**	0.313**	0.281**	-0.066	-0.206	-0.248*
	(-2.71)	(-3.42)	(-3.36)	(2.41)	(2.29)	(2.02)	(-0.53)	(-1.63)	(-1.93)
EIA_t * LANG	-0.021	-0.073	-0.075	0.023	0.050	0.065	0.002	-0.022	-0.010
	(-0.19)	(-0.65)	(-0.65)	(0.25)	(0.54)	(0.67)	(0.02)	(-0.22)	(-0.10)
EIA_t * RELIG	0.467***	0.369***	0.355***	-0.047	-0.105	-0.066	0.420***	0.264**	0.289***
	(3.83)	(2.85)	(2.69)	(-0.43)	(-0.93)	(-0.57)	(4.00)	(2.42)	(2.60)
EIA_t * LEGAL	0.249***	0.183**	0.157*	0.032	0.009	-0.016	0.281***	0.192**	0.141*
	(2.73)	(2.02)	(1.70)	(0.38)	(0.11)	(-0.19)	(3.44)	(2.44)	(1.75)
EIA_t * COLONY	-0.324*	-0.286*	-0.252	0.046	0.018	0.010	-0.277**	-0.268**	-0.242**
	(-1.90)	(-1.81)	(-1.55)	(0.37)	(0.15)	(0.08)	(-2.09)	(-2.27)	(-2.00)
EIA_t * WTO-$BOTH_t$		0.010	0.035		0.085	0.057		0.094	0.093
		(0.06)	(0.22)		(0.57)	(0.39)		(0.65)	(0.64)
EIA_t * $DPOLITY_t$		-0.011	-0.012		-0.011	-0.012*		-0.022***	-0.024***
		(-1.49)	(-1.58)		(-1.60)	(-1.81)		(-3.65)	(-3.98)
EIA_t * Difference in ln $PCGDP_t$		-0.129***	-0.138***		-0.015	-0.012		-0.144***	-0.150***
		(-3.05)	(-3.22)		(-0.34)	(-0.28)		(-3.89)	(-4.02)
EIA_t * ln Exporter $PCGDP_t$		-0.065	-0.063		0.048	0.034		-0.017	-0.029
		(-1.62)	(-1.56)		(1.24)	(0.88)		(-0.47)	(-0.80)
EIA_t * ln Importer $PCGDP_t$		-0.071*	-0.062		-0.071**	-0.058		-0.142***	-0.120***
		(-1.81)	(-1.53)		(-1.99)	(-1.57)		(-4.25)	(-3.51)
EIA_t * $\ln(TAR_7)_t$		-0.702*	-0.087		0.540	1.679**		-0.162	1.591**
		(-1.78)	(-0.11)		(1.42)	(2.21)		(-0.45)	(2.27)
$\ln(t_7)_t$			-2.012***			-0.249			-2.261***
			(-2.85)			(-0.36)			(-3.65)
$\ln(t_7)_t$ * ln DIST			-1.004***			0.706**			-0.298
			(-3.01)			(1.96)			(-0.95)
$\ln(t_7)_t$ * ADJ			-0.392			-0.552			-0.945
			(-0.49)			(-0.67)			(-1.21)
$\ln(t_7)_t$ * LANG			-0.043			-0.735			-0.778
			(-0.07)			(-1.20)			(-1.32)
$\ln(t_7)_t$ * RELIG			0.045			0.881			0.926
			(0.07)			(1.36)			(1.50)
$\ln(t_7)_t$ * LEGAL			-0.280			-0.512			-0.792
			(-0.55)			(-0.97)			(-1.63)
$\ln(t_7)_t$ * COLONY			0.936			0.105			1.041*
			(1.17)			(0.12)			(1.75)
$\ln(t_7)_t$ * WTO-$BOTH_t$			0.515			-1.105			-0.590
			(0.58)			(-1.33)			(-0.96)
$\ln(t_7)_t$ * $DPOLITY_t$			0.045			-0.056			-0.011
			(1.14)			(-1.58)			(-0.34)
$\ln(t_7)_t$ * Difference in ln $PCGDP_t$			-0.656***			0.323			-0.333
			(-2.60)			(1.38)			(-1.58)
$\ln(t_7)_t$ * ln Exporter $PCGDP_t$			0.270			-0.347			-0.077
			(1.05)			(-1.37)			(-0.35)
$\ln(t_7)_t$ * ln Importer $PCGDP_t$			-0.091			0.242			0.151
			(-0.26)			(0.72)			(0.47)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.849	0.849	0.850	0.885	0.885	0.886	0.941	0.941	0.941
N	17,172	17,172	17,172	17,172	17,172	17,172	17,172	17,172	17,172

Part I: SITC 8

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA$_t$	-0.128***	-0.078	-0.076	0.172***	0.143***	0.137**	0.044	0.064	0.061
	(-2.86)	(-1.54)	(-1.51)	(3.54)	(2.62)	(2.52)	(1.07)	(1.48)	(1.40)
EIA$_t$ * ln DIST	0.114*	0.185***	0.167***	-0.166**	-0.246***	-0.212***	-0.052	-0.061	-0.045
	(1.86)	(2.83)	(2.63)	(-2.52)	(-3.28)	(-2.89)	(-0.94)	(-1.03)	(-0.77)
EIA$_t$ * ADJ	0.012	-0.155	-0.134	0.112	0.181	0.150	0.124	0.027	0.016
	(0.08)	(-1.06)	(-0.90)	(0.76)	(1.22)	(1.00)	(1.14)	(0.23)	(0.14)
EIA$_t$ * LANG	0.009	-0.005	0.022	-0.028	-0.031	-0.012	-0.019	-0.036	0.010
	(0.10)	(-0.05)	(0.24)	(-0.28)	(-0.30)	(-0.12)	(-0.19)	(-0.38)	(0.10)
EIA$_t$ * RELIG	0.239*	0.218	0.225*	0.047	0.013	0.010	0.287***	0.231**	0.235**
	(1.86)	(1.64)	(1.67)	(0.36)	(0.10)	(0.07)	(2.85)	(2.14)	(2.16)
EIA$_t$ * LEGAL	0.111	0.014	-0.038	-0.023	-0.024	0.008	0.088	-0.010	-0.030
	(1.22)	(0.15)	(-0.40)	(-0.22)	(-0.22)	(0.08)	(0.91)	(-0.10)	(-0.32)
EIA$_t$ * COLONY	-0.699***	-0.723**	-0.658**	0.099	0.115	0.114	-0.601***	-0.608***	-0.544***
	(-2.75)	(-2.47)	(-2.21)	(0.63)	(0.65)	(0.65)	(-3.36)	(-3.16)	(-2.74)
EIA$_t$ * WTO-BOTH$_t$		-0.082	-0.044		-0.085	-0.117		-0.166	-0.161
		(-0.55)	(-0.30)		(-0.52)	(-0.71)		(-1.32)	(-1.28)
EIA$_t$ * DPOLITY$_t$		-0.017**	-0.017**		0.008	0.007		-0.009	-0.010*
		(-2.38)	(-2.49)		(1.07)	(0.95)		(-1.40)	(-1.66)
EIA$_t$ * Difference in ln PCGDP$_t$		-0.084**	-0.088**		-0.062	-0.059		-0.146***	-0.147***
		(-2.04)	(-2.12)		(-1.37)	(-1.30)		(-4.01)	(-4.03)
EIA$_t$ * ln Exporter PCGDP$_t$		-0.136***	-0.141***		0.130***	0.125***		-0.006	-0.016
		(-3.23)	(-3.36)		(2.96)	(2.86)		(-0.19)	(-0.48)
EIA$_t$ * ln Importer PCGDP$_t$		-0.130***	-0.133***		0.067*	0.095**		-0.063*	-0.037
		(-4.22)	(-3.91)		(1.90)	(2.56)		(-1.90)	(-1.07)
EIA$_t$ * ln(TAR$_8$)$_t$		0.008	-0.572		0.035	1.467***		0.043	0.895**
		(0.04)	(-1.06)		(0.18)	(2.84)		(0.25)	(1.97)
ln(t$_8$)$_t$			0.141			-0.980**			-0.839**
			(0.30)			(-2.08)			(-2.07)
ln(t$_8$)$_t$ * ln DIST			-0.337			0.592**			0.255
			(-1.25)			(2.33)			(1.15)
ln(t$_8$)$_t$ * ADJ			0.661			-0.715			-0.054
			(1.22)			(-1.39)			(-0.14)
ln(t$_8$)$_t$ * LANG			1.239***			-0.375			0.864**
			(2.71)			(-0.94)			(2.41)
ln(t$_8$)$_t$ * RELIG			0.614			-0.431			0.183
			(1.03)			(-0.81)			(0.45)
ln(t$_8$)$_t$ * LEGAL			-1.233**			1.005**			-0.229
			(-2.32)			(2.13)			(-0.63)
ln(t$_8$)$_t$ * COLONY			0.507			0.310			0.818
			(0.66)			(0.54)			(1.36)
ln(t$_8$)$_t$ * WTO-BOTH$_t$			1.418***			-0.632			0.787**
			(2.96)			(-1.41)			(2.02)
ln(t$_8$)$_t$ * DPOLITY$_t$			0.057**			-0.037			0.020
			(1.97)			(-1.45)			(0.83)

(1) Variables	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$\ln(t_8)_t$ * Difference in ln $PCGDP_t$			-0.236			0.142			-0.094
			(-1.39)			(0.92)			(-0.74)
$\ln(t_8)_t$ * ln Exporter $PCGDP_t$			0.150			-0.237			-0.087
			(0.99)			(-1.64)			(-0.70)
$\ln(t_8)_t$ * ln Importer $PCGDP_t$			0.556^{***}			-0.312			0.245
			(2.59)			(-1.48)			(1.43)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.861	0.861	0.862	0.908	0.908	0.909	0.952	0.952	0.952
N	11,476	11,476	11,476	11,476	11,476	11,476	11,476	11,476	11,476

Part J: SITC 9

(1) Variables	(2)	(3) Extensive	(4)	(5)	(6) Intensive	(7)	(8)	(9) Trade	(10)
EIA_t	0.021	0.114	0.104	0.030	0.078	0.075	0.051	0.192	0.179
	(0.19)	(0.97)	(0.89)	(0.20)	(0.47)	(0.45)	(0.33)	(1.15)	(1.08)
EIA_t * ln DIST	0.325^{**}	0.811^{***}	0.772^{***}	0.035	-0.034	-0.051	0.360^{*}	0.777^{***}	0.721^{***}
	(2.06)	(3.88)	(3.73)	(0.19)	(-0.14)	(-0.21)	(1.86)	(3.40)	(3.20)
EIA_t * ADJ	0.914^{**}	1.035^{**}	0.888^{*}	-0.775^{*}	-0.139	-0.008	0.139	0.897^{*}	0.879^{*}
	(2.29)	(2.14)	(1.79)	(-1.67)	(-0.27)	(-0.02)	(0.31)	(1.83)	(1.77)
EIA_t * LANG	-0.385	-0.203	-0.241	0.442^{*}	0.261	0.131	0.057	0.058	-0.110
	(-1.47)	(-0.83)	(-0.97)	(1.71)	(1.03)	(0.53)	(0.21)	(0.24)	(-0.46)
EIA_t * RELIG	0.086	0.533	0.576	0.273	0.382	0.191	0.359	0.915^{**}	0.767^{*}
	(0.27)	(1.40)	(1.52)	(0.64)	(0.83)	(0.41)	(0.84)	(2.10)	(1.81)
EIA_t * LEGAL	-0.651^{***}	-0.411^{**}	-0.418^{**}	0.599^{**}	0.672^{**}	0.671^{**}	-0.052	0.261	0.253
	(-2.95)	(-2.02)	(-1.98)	(2.04)	(2.03)	(2.04)	(-0.17)	(0.83)	(0.81)
EIA_t * COLONY	0.534^{*}	0.174	0.241	-0.449	-0.363	-0.104	0.085	-0.189	0.137
	(1.76)	(0.53)	(0.70)	(-0.89)	(-0.69)	(-0.20)	(0.18)	(-0.35)	(0.26)
EIA_t * WTO-$BOTH_t$		-0.042	0.039		-0.337	-0.438		-0.379	-0.398
		(-0.18)	(0.17)		(-0.92)	(-1.17)		(-1.09)	(-1.15)
EIA_t * $DPOLITY_t$		0.063^{*}	0.058^{*}		-0.014	-0.012		0.049	0.046
		(1.88)	(1.83)		(-0.50)	(-0.43)		(1.59)	(1.51)
EIA_t * Difference in ln $PCGDP_t$		0.245^{**}	0.215^{**}		0.415^{***}	0.412^{***}		0.660^{***}	0.627^{***}
		(2.35)	(2.02)		(3.05)	(3.04)		(4.92)	(4.82)
EIA_t * ln Exporter $PCGDP_t$		-0.204^{*}	-0.238^{**}		0.318^{***}	0.400^{***}		0.114	0.162
		(-1.82)	(-2.09)		(2.65)	(3.19)		(0.90)	(1.23)
EIA_t * ln Importer $PCGDP_t$		-0.402^{***}	-0.441^{***}		0.281^{**}	0.286^{**}		-0.120	-0.155
		(-3.07)	(-3.26)		(2.24)	(2.23)		(-0.91)	(-1.15)
EIA_t * $\ln(TAR_9)_t$		-0.630	-1.389		-0.501	-2.726^{**}		-1.130^{*}	-4.115^{***}
		(-0.97)	(-1.11)		(-0.72)	(-1.97)		(-1.88)	(-3.09)
$\ln(t_9)_t$			0.854			2.231^{**}			3.085^{***}
			(1.07)			(2.29)			(3.27)
$\ln(t_9)_t$ * ln DIST			-1.234			0.241			-0.994
			(-1.57)			(0.30)			(-1.46)
$\ln(t_9)_t$ * ADJ			-2.599			-0.636			-3.235^{**}
			(-1.59)			(-0.38)			(-2.31)
$\ln(t_9)_t$ * LANG			-0.564			-1.242			-1.806
			(-0.39)			(-0.78)			(-1.32)
$\ln(t_9)_t$ * RELIG			1.589			1.466			3.055^{**}
			(1.13)			(0.93)			(2.06)
$\ln(t_9)_t$ * LEGAL			-0.903			1.565			0.662

			(-0.65)			(0.95)			(0.45)
$\ln(t_9)_t$ * COLONY			-5.029***			6.643***			1.613
			(-2.96)			(3.91)			(1.13)
$\ln(t_9)_t$ * WTO-BOTH$_t$			1.520			-0.941			0.579
			(1.21)			(-0.69)			(0.42)
$\ln(t_9)_t$ * DPOLITY$_t$			0.103			0.072			0.175
			(0.75)			(0.61)			(1.57)
$\ln(t_9)_t$ * Difference in ln PCGDP$_t$			0.814			-0.434			0.380
			(1.47)			(-0.72)			(0.62)
$\ln(t_9)_t$ * ln Exporter PCGDP$_t$			-0.875*			-0.088			-0.963*
			(-1.69)			(-0.15)			(-1.66)
$\ln(t_9)_t$ * ln Importer PCGDP$_t$			1.641**			-0.759			0.882
			(2.30)			(-1.00)			(1.19)
Fixed Effects:									
Exporter-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Importer-Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.795	0.798	0.800	0.901	0.903	0.904	0.901	0.903	0.904
N	3,384	3,384	3,384	3,384	3,384	3,384	3,384	3,384	3,384

Notes: * $p < .10$, ** $p < .05$, *** $p < .01$, respectively. Cutoff for nontraded goods is $1,000,000; this affects the sample size. t-statistics are in parentheses.

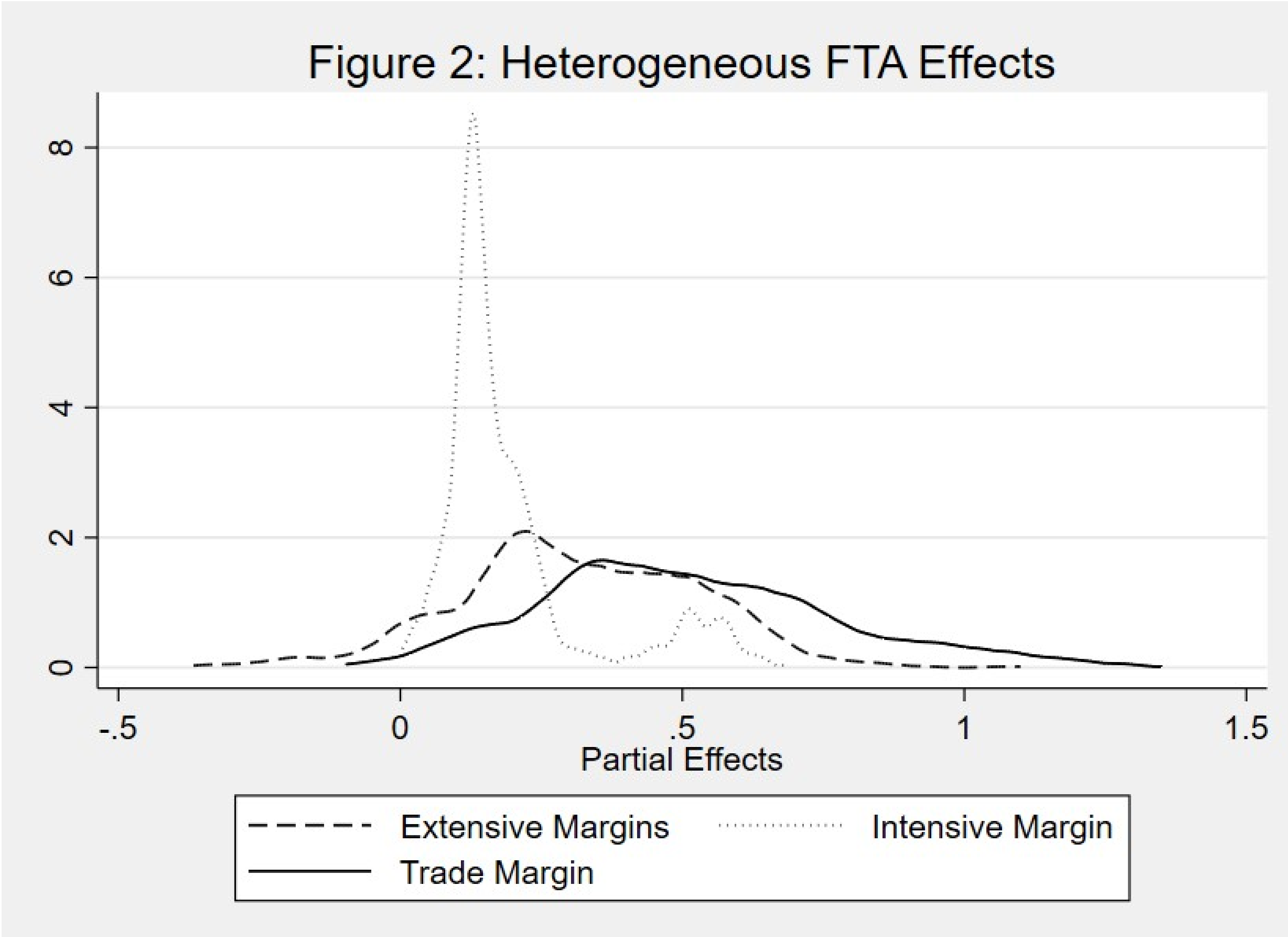


Figure 2: Heterogeneous FTA Effects
8
6
4
2
0
-.5
0
.5
1
1.5
Partial Effects
Extensive Margins
Intensive Margin
Trade Margin

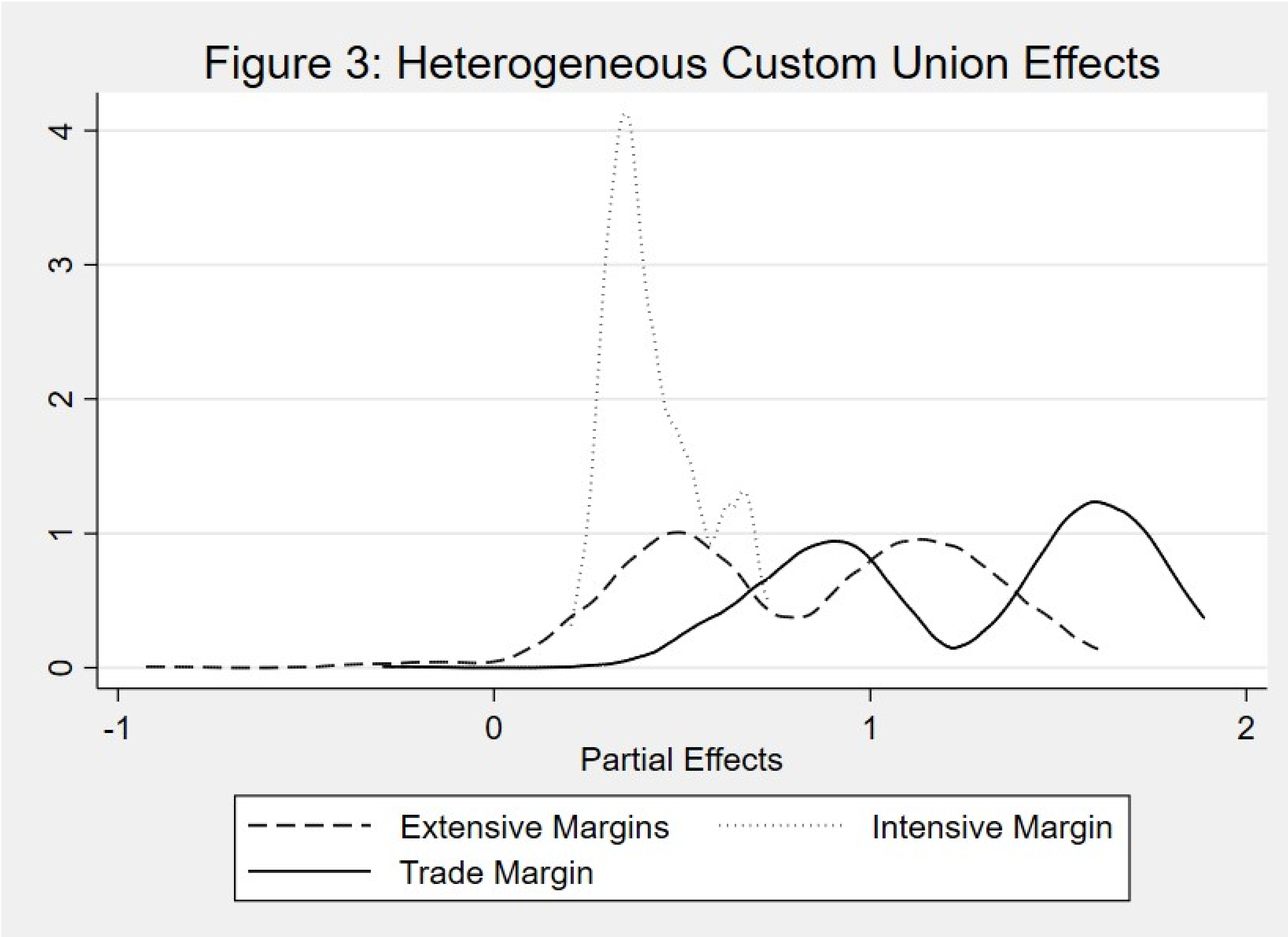


Figure 3: Heterogeneous Custom Union Effects
0
1
2
3
4
-1
0
1
2
Partial Effects
Extensive Margins
Intensive Margin
Trade Margin

Figure 4: Heterogeneous Common Market Effects

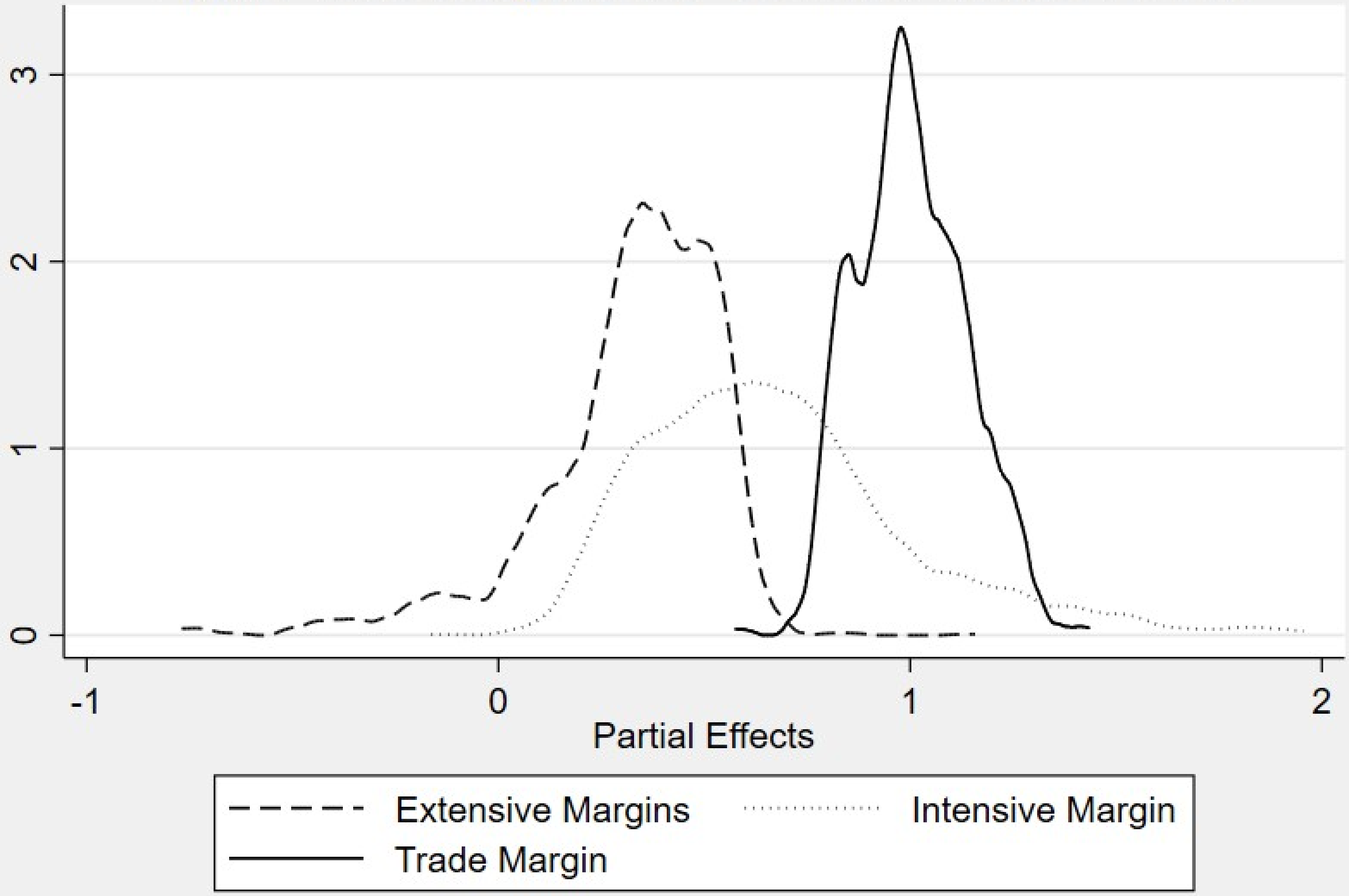
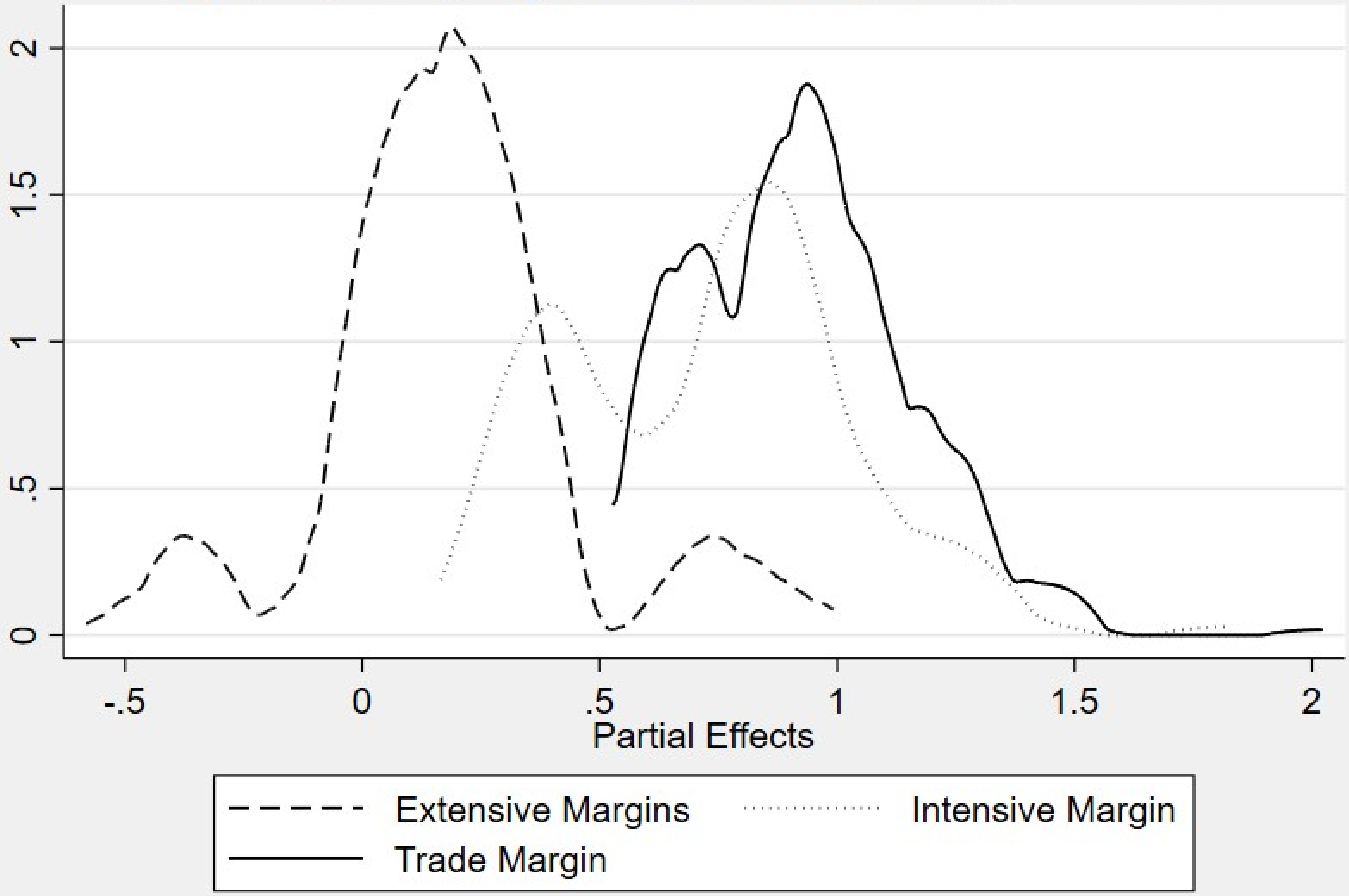


Figure 5: Heterogeneous Economic Union Effects



Online Appendix 6: Welfare

Following the Supplementary Appendix in Redding (2011), assume indirect utility of the representative consumer in country j is given by:

$$V_j = \frac{w_j}{P_j} \tag{1}$$

where w_j is the nominal wage rate and P_j is the CES price index, analogous to equation (24) in Online Appendix 2:

$$P_j^{1-\sigma} = \sum_i M_i \left(\frac{1 - G(\varphi_{ij}^*)}{1 - G(\varphi_{ii}^*)} \right) \int_{\varphi_{ij}^*}^{\infty} p_{ij}(\varphi)^{1-\sigma} \frac{g(\varphi)}{1 - G(\varphi_{ij}^*)} d\varphi \quad . \tag{2}$$

ZPC condition (27) in Online Appendix 2 can be rewritten, noting $p = (\sigma - 1)/\sigma$, as

$$\left(\frac{\sigma}{\sigma - 1} w_i \tau_{ij} \right)^{1-\sigma} = \frac{A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}}{(\varphi_{ij}^*)^{\sigma-1} \sigma^{-1} L_j P_j^{\sigma-1}}. \tag{3}$$

As in equation (24)-(26) in Online Appendix 2, we can substitute $\frac{w_i \tau_{ij}}{(\sigma-1)/\sigma)\varphi}$ for p_{ij} in equation (2), use the Pareto distribution, and integrate the resulting equation to yield:

$$P_j^{1-\sigma} = \sum_i M_i \left(\frac{\varphi_{ii}^*}{\varphi_{ij}^*} \right)^{\gamma} (\varphi_{ij}^*)^{\sigma-1} \left(\frac{\gamma}{\gamma - \sigma + 1} \right) \left(\frac{\sigma}{\sigma - 1} w_i \tau_{ij} \right)^{1-\sigma} \quad . \tag{4}$$

Substituting the RHS of equation (3) for $\left(\frac{\sigma}{\sigma-1} w_i \tau_{ij}\right)^{1-\sigma}$ in equation (4) above yields:

$$P_j^{1-\sigma} = \sum_i M_i \left(\frac{\varphi_{ii}^*}{\varphi_{ij}^*} \right)^{\gamma} \frac{A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}}{\sigma^{-1} L_j} P_j^{1-\sigma} \left(\frac{\gamma}{\gamma - \sigma + 1} \right)$$

or

$$1 = \sum_i M_i \left(\frac{\varphi_{ii}^*}{\varphi_{ij}^*} \right)^{\gamma} \frac{A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}}{\sigma^{-1} L_j} \left(\frac{\gamma}{\gamma - \sigma + 1} \right) \quad . \tag{5}$$

Note that ZPC condition (3) above can be written also as:

$$\varphi_{ij}^* = \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta} \right]^{\frac{1}{\sigma-1}} \frac{\sigma}{\sigma - 1} w_i \tau_{ij} \sigma^{\frac{1}{\sigma-1}} P_j^{-1} L_j^{-\frac{1}{\sigma-1}}. \tag{6}$$

Substituting equation (6) above for φ_{ij}^* in $(\varphi_{ij}^*)^{-\gamma}$ in equation (5) yields:

$$1 = \sum_i M_i (\varphi_{ii}^*)^{\gamma} \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta} \right]^{1-\frac{\gamma}{\sigma-1}} \left(\frac{\sigma}{\sigma - 1} w_i \tau_{ij} \right)^{-\gamma} \sigma^{1-\frac{\gamma}{\sigma-1}} L_j^{-\left(1-\frac{\gamma}{\sigma-1}\right)} P_j^{\gamma} \left(\frac{\gamma}{\gamma - \sigma + 1} \right)$$

$$\Rightarrow P_j^{-\gamma} = \left(\frac{\gamma}{\gamma-\sigma+1}\right) \sum_i M_i(\varphi_{ij}^*)^{\gamma} \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}\right]^{1-\frac{\gamma}{\sigma-1}} \left(\frac{\sigma}{\sigma-1} w_i \tau_{ij}\right)^{-\gamma} \sigma^{1-\frac{\gamma}{\sigma-1}} L_j^{-\left(1-\frac{\gamma}{\sigma-1}\right)}. \tag{7}$$

Substituting in equation (7), the solution for the mass of firms, M_i, in equation (35) in Online Appendix 2 yields:

$$P_j^{-\gamma} = \sigma^{1-\frac{\gamma}{\sigma-1}} \left(\frac{\sigma}{\sigma-1}\right)^{-\gamma} \left(\frac{\gamma}{\gamma-\sigma+1}\right) L_j^{-\left(1-\frac{\gamma}{\sigma-1}\right)} \sum_i \alpha_i L_i (w_i \tau_{ij})^{-\gamma} \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}\right]^{1-\frac{\gamma}{\sigma-1}}. \tag{8}$$

Substituting ZPC condition (6) above into trade-share equation (40) from Online Appendix 2 yields:

$$\lambda_{ij} = \frac{\alpha_i L_i \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}\right]^{1-\frac{\gamma}{\sigma-1}} \left(\frac{\sigma}{\sigma-1}\right)^{-\gamma} (w_i \tau_{ij})^{-\gamma} \sigma^{-\frac{\gamma}{\sigma-1}} P_j^{\gamma} L_j^{\frac{\gamma}{\sigma-1}}}{\sum_i \alpha_i L_i \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}\right]^{1-\frac{\gamma}{\sigma-1}} \left(\frac{\sigma}{\sigma-1}\right)^{-\gamma} (w_i \tau_{ij})^{-\gamma} \sigma^{-\frac{\gamma}{\sigma-1}} P_j^{\gamma} L_j^{\frac{\gamma}{\sigma-1}}}$$

$$\Rightarrow \lambda_{ij} = \frac{\alpha_i L_i (w_i \tau_{ij})^{-\gamma} \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}\right]^{1-\frac{\gamma}{\sigma-1}}}{\sum_i \alpha_i L_i (w_i \tau_{ij})^{-\gamma} \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}\right]^{1-\frac{\gamma}{\sigma-1}}}.$$

Consider now the intranational trade share, λ_{jj}. If we assume (as noted earlier) that $\tau_{jj} = 1$ and that endogenous export fixed costs (i.e., network spillovers) only apply internationally (not intranationally), then:

$$\lambda_{jj} = \frac{\alpha_j L_j w_j^{-\gamma} A_{jj}^{1-\frac{\gamma}{\sigma-1}}}{\sum_i \alpha_i L_i (w_i \tau_{ij})^{-\gamma} \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}\right]^{1-\frac{\gamma}{\sigma-1}}}$$

which implies:

$$w_j^{\gamma} = \frac{\alpha_j L_j A_{jj}^{1-\frac{\gamma}{\sigma-1}}}{\lambda_{jj} \sum_i \alpha_i L_i (w_i \tau_{ij})^{-\gamma} \left[A_{ij} + M_{ij}(\varphi_{ij}^*)^{-\eta}\right]^{1-\frac{\gamma}{\sigma-1}}}. \tag{9}$$

Multiplying wage equation (9) above with CES price index equation (8) above, and recalling $\alpha_j = (\sigma-1)/(\gamma\sigma f_j^e)$, yields:

$$\left(\frac{w_j}{P_j}\right)^{\gamma} = \lambda_{jj}^{-1} L_j^{\frac{\gamma}{\sigma-1}} \left[\frac{A_{jj}^{1-\frac{\gamma}{\sigma-1}}}{f_j^e \left(\frac{\sigma}{\sigma-1}\right)^{1+\gamma} \sigma^{\frac{\gamma}{\sigma-1}-1} \gamma} \frac{\gamma}{\gamma-\sigma+1}\right]$$

$$\Rightarrow \frac{w_j}{P_j} = \lambda_{jj}^{-\frac{1}{\gamma}} L_j^{\frac{1}{\sigma-1}} \left[\frac{A_{jj}^{1-\frac{\gamma}{\sigma-1}}}{f_j^e \left(\frac{\sigma}{\sigma-1}\right)^{\gamma} \sigma^{\frac{\gamma}{\sigma-1}}} \frac{\sigma-1}{\gamma-\sigma+1}\right]^{\frac{1}{\gamma}}$$

which is identical to w_j/P_j in Section 6 of Redding (2011) and equation (48) in the Supplementary Appendix to Redding (2011).

Online Appendix 7: Measuring Welfare Changes

As shown in Online Appendix 6, using the ZPC condition and the trade-share equations, we can show that indirect welfare in our model (V_j) can be expressed as:

$$V_j = w_j/P_j = \lambda_{jj}^{-\frac{1}{\gamma}} L_j^{\frac{1}{\sigma-1}} \left[\frac{A_{jj}^{1-\frac{\gamma}{\sigma-1}}}{f_j^e(\frac{\sigma}{\sigma-1})^{\gamma}\sigma^{\frac{\sigma}{\sigma-1}}} \frac{\sigma-1}{\gamma-\sigma-1} \right]^{\frac{1}{\gamma}} \tag{10}$$

which is identical to V_j in section 6 in Redding (2011) and equation (48) in the Supplementary Appendix to Redding (2011). It follows then that the change in welfare from an international trade-policy liberalization (holding constant labor L_j, domestic fixed costs A_{jj}, and entry costs f_j^e) turns out to be:

$$d\ln V_j = (-1/\gamma)d\ln\lambda_{jj}. \tag{11}$$

which is identical to that in Arkolakis, Costinot, and Rodriguez-Clare (2012), where γ is the Pareto shape parameter in our model and λ_{jj} is intra-national trade in j divided by j's gross output.

In this appendix, we describe in detail how we calculate $d\ln V_{ij}$. Specifically, we will calculate values for V_{ij} in both a "baseline" scenario (denoted b) and a "counterfactual" scenario (denoted c). First, our empirical estimation in section 4 (using estimates from Table 4) provides heterogeneous partial effects of an EIA for the aggregate trade flow, denoted $\widehat{\beta_{ij}}$. For 1,358 bilateral EIA liberalizations (ij), the $\widehat{\beta_{ij}}$ are calculated using the EIA coefficient estimates and interaction terms' coefficient estimates from Table 4, column 3 alongside the demeaned levels of the various trade-cost variables (Z_{ij}) described in section 3. Also, the empirical model generates estimates of time-invariant bilateral trade costs, denoted $\widehat{\psi_{ij}}$. Together, these provide an estimate of initial bilateral trade costs, $\widehat{\psi_{ij}} + \widehat{\beta_{ij}}EIA_{ijt}$, for the baseline scenario. We assume, as in Head and Mayer (2014), that $\gamma = 5$. Given the matrix of initial bilateral trade costs for all trade flows (including for intra-national trade flows) for year 2005, we use our structural gravity framework as in Baier, Kerr, and Yotov (2017) and Head and Mayer (2014) to generate the multilateral outward (exporter) and multilateral inward (importer) price terms, Π_i and P_j, respectively (from which w_i and Y_i can also be generated, as w_i is a function of Π_i and $Y_i = w_i L_i$). However, in the baseline scenario, we generate the matrix of trade flows X_{ij}^b (including X_{jj}^b) using the imputed multilateral price terms and actual initial nominal gross outputs; the latter were obtained from the World Input-Output Data (WIOD) base.[13] The limited availability of output data restricted the number of countries to 61 and the number of EIA liberalizations to 1,358. Hence, initial w_i is set equal to nominal per capita output.[14] This yields the full set of baseline international and intra-national trade flows, bilateral trade costs, wage rates (w_j^b), nominal incomes (Y_j^b), importer

[13] By our construction, there are no trade deficits or surpluses; total expenditures equal total output.

[14] As standard in such frameworks, the multilateral price terms can be solved for only up to a scalar. Consequently, a normalization is needed; we normalize by world nominal gross output.

CES price indexes (P_j^b); initial price levels p_i^b can be solved for given w_i^b. Consequently, we can solve for baseline welfare, $V_{ij}^b = w_j^b / P_j^b$.[15]

Computation of the counterfactual welfare level, V_{ij}^c, is then straightforward. For each of the 1,358 ij bilateral liberalizations, we remove the EIA, eliminating the partial (direct) effect of the EIA on X_{ij}.[16] This generates a set of counterfactual bilateral trade costs, $(\widehat{\psi_{ij}^c})$. Using the new counterfactual trade costs, we compute the counterfactual multilateral outward price terms, multilateral inward price terms, nominal wage rates, and nominal gross outputs. These variables are then used to generate a set of counterfactual international and intra-national trade flows, which are then used to determine a new set of multilateral outward price terms, multilateral inward price terms, nominal wage rates, and nominal gross outputs. We iterate using a dampening factor until the changes in wage rates, prices, and trade-flow shares are essentially zero, and compute the (final) counterfactual level of welfare, $V_{ij}^c = w_j^c / P_j^c$. From this, we can compute $d \ln V_{ij}$, which equals $(-\gamma) d \ln \lambda_{jj}$. We conduct this process 1,358 times for 1,358 bilateral EIA removals. Finally, every one of the 1,358 simulations yielded unique values for the N national wage rates w_j, supporting section 2's theoretical conjecture of unique wage rates.

[15]An alternative method is to omit direct calculation of the multilateral outward price index Π_i and solve initially for w_i and P_j, which then implies endogenous nominal gross outputs in the baseline scenario. This alternative method simply collapses together the "multilateral price" and "nominal income" adjustment contributions, cf., Head and Mayer (2014).

[16]Note that for the reciprocal EIA liberalizations we account for the direct effect on X_{ji}.

Online Appendix 8: Probit Tables

A8.1: Probit Results: 1970-1990

Table 9: Probit Results: 1970-1990

	(1) EIA (1970)	(2) EIA (1975)	(3) EIA (1980)	(4) EIA (1985)	(5) EIA (1990)
ln DIST	-0.944***	-1.101***	-1.117***	-1.123***	-1.185***
	(-14.51)	(-22.72)	(-23.10)	(-24.90)	(-27.23)
ADJ	-0.874***	-1.031***	-1.073***	-1.029***	-0.916***
	(-4.82)	(-7.25)	(-7.34)	(-7.44)	(-7.21)
LANG	0.00290	0.242*	0.195*	0.371***	0.317***
	(0.02)	(2.44)	(1.98)	(4.03)	(3.62)
LEGAL	0.229	0.0592	0.0621	0.0489	-0.00484
	(1.94)	(0.69)	(0.74)	(0.63)	(-0.07)
COLONY	-0.269	-0.287	-0.0562	-0.248	-0.0560
	(-0.83)	(-1.31)	(-0.28)	(-1.26)	(-0.33)
RELIG	0.497***	0.308**	0.308**	0.215*	0.0686
	(3.59)	(3.03)	(3.04)	(2.25)	(0.76)
Sum GDP	0.290 ***	0.383 ***	0.340 ***	0.330 ***	0.452 ***
	(4.56)	(7.80)	(6.99)	(6.97)	(10.64)
$\|DiffGDP\|$	-0.136 ***	-0.153 **	-0.126 ***	-0.151 ***	-0.190 ***
	(-2.69)	(-3.89)	(-3.22)	(-3.96)	(-5.83)
Constant	0.917	0.672	1.180*	2.287***	0.742
	(1.13)	(1.17)	(2.07)	(4.08)	(1.42)
N	9912	11530	11604	10700	11552
$Pseudo R^2$	0.354	0.398	0.403	0.402	0.418

z statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A8.2: Probit Results: 1995-2010

Table 10: Probit Results: 1995-2010

	(1) EIA (1995)	(2) EIA (2000)	(3) EIA (2005)	(4) EIA (2010)
ln DIST	-1.165***	-1.214***	-1.177***	-1.098***
	(-36.89)	(-48.58)	(-58.47)	(-59.28)
ADJ	-0.572***	-0.352***	-0.400***	-0.226**
	(-6.49)	(-4.71)	(-5.50)	(-3.16)
LANG	0.677***	0.535***	0.451***	0.451***
	(10.64)	(11.17)	(11.25)	(11.86)
LEGAL	-0.221***	-0.0636	-0.0221	-0.0243
	(-4.00)	(-1.54)	(-0.66)	(-0.78)
COLONY	-0.353*	0.000277	-0.0896	-0.217*
	(-2.46)	(0.00)	(-0.94)	(-2.32)
RELIG	0.207**	0.300***	0.241***	0.206***
	(3.14)	(5.98)	(5.75)	(5.21)
Sum GDP	0.505***	0.537***	0.426***	0.420***
	(15.59)	(20.27)	(20.08)	(20.79)
$\lvert DiffGDP \rvert$	-0.239***	-0.275***	-0.209**	-0.198***
	(-9.61)	(-13.40)	(-12.69)	(-12.55)
Constant	0.559	1.275***	2.603***	1.955***
	(1.48)	(4.28)	(10.36)	(8.23)
N	16904	21724	23196	22805
$PseudoR^2$	0.421	0.443	0.401	0.360

z statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Theoretical Supplement to Online Appendix 2: N-Country Open-Economy Melitz Model with Per Unit Freight Costs

S2.1: Consumer Behavior

Consumer preferences are defined over a continuum of differentiated varieties Ω_j in a single monopolistically competitive industry, taking the form:

$$U_j = \left(\int_{\omega \in \Omega_j} q(\omega)^{\frac{\sigma-1}{\sigma}} d\omega \right)^{\frac{\sigma}{\sigma-1}} \tag{1}$$

where $q(\omega)$ is the quantity of product ω consumed of available varieties Ω_j. The elasticity of substitution across varieties is σ, where $\sigma > 1$ by assumption. Maximizing utility subject to a standard income constraint:

$$w_j L_j + T_j = \int_{\omega \in \Omega_j} p'(\omega) q(\omega) d\omega$$

where w_j is the wage rate in country j, L_j is the labor force (population), T_j is tariff revenue potentially rebated back to households, and $p'(\omega)$ is the price paid for variety ω yields a demand function in country j for country i's variety

$$q_{ij}(\omega) = \left(\frac{p'_{ij}(\omega)}{P_j} \right)^{-\sigma} \left(\frac{E_j}{P_j} \right) \tag{2}$$

where aggregate expenditures, E_j, equals labor income plus tariff-revenue income, $w_j L_j + T_j$, and P_j is the ideal price index of the form:

$$P_j = \left[\int_{\omega \in \Omega_j} p'(\omega)^{1-\sigma} d\omega \right]^{\frac{1}{1-\sigma}}. \tag{3}$$

and $p'_{ij}(\omega) = [p_{ij}(\omega)]\, t_{ij}$ with $t_{ij} > 1$.

S2.2: Production

Firms in the single industry in country i produce a differentiated variety ω at a cost, $c(q_{ij})$, with heterogenous productivity under monopolistic competition. Production of a variety for any market j ($j = 1, ..., N$) entails a fixed cost. In our model, the cost of sending $q_{ij}(\omega)$

goods to destination market j is given by:

$$\begin{aligned} c(q_{ij}) &= \frac{w_i q_{ij}}{\varphi} + g_{ij} q_{ij} + w_j \big(A_{ij} + M_{ij}^{-\eta}\big) \\ &= \left(\frac{w_i}{\varphi} + g_{ij}\right) q_{ij} + w_j \big(A_{ij} + M_{ij}^{-\eta}\big) \end{aligned} \tag{4}$$

where g_{ij} is the (exogenous) freight cost per unit of output, φ is the firm's productivity level, A_{ij} is an exogenous export fixed costs, and (as in the paper) endogenous export fixed costs are a function of the equilibrium number of firms in country i that export to j with η defined as the "network effect." The distinguishing feature of this Supplement is the exogenous freight cost *per unit of output*.

Profit maximization for firm φ in country i selling in country j yields:

$$p_{ij} = \frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho} \tag{5}$$

where $\rho = \frac{\sigma-1}{\sigma}$.

S2.2.1: Profit Maximization

We define country i's firm φ's profits from selling in j

$$\pi_{ij}(\varphi) = p_{ij} q_{ij} - \left(\frac{w_i}{\varphi} + g_{ij}\right) q_{ij} - w_j \left(A_{ij} + M_{ij}^{-\eta}\right)$$

From above, we know q_{ij} is determined by:

$$q_{ij} = \left(\frac{p_{ij} t_{ij}}{P_j}\right)^{-\sigma} \frac{E_j}{P_j}$$

Substituting the expression above for q_{ij} in the profit function above yields:

$$\pi_{ij}(\varphi) = p_{ij} \left(\frac{p_{ij} t_{ij}}{P_j}\right)^{-\sigma} \frac{E_j}{P_j} - \left(\frac{w_i}{\varphi} + g_{ij}\right) \left(\frac{p_{ij} t_{ij}}{P_j}\right)^{-\sigma} \frac{E_j}{P_j} - w_j \left(A_{ij} + M_{ij}^{-\eta}\right).$$

Taking the derivative of π_{ij} with respect to p_{ij} yields:

$$\begin{aligned} \frac{\partial \pi_{ij}}{\partial p_{ij}} = (1-\sigma) \left(\frac{t_{ij}}{P_j}\right)^{-\sigma} \frac{E_j}{P_j} p_{ij}^{-\sigma} - (-\sigma) \left(\frac{w_i}{\varphi} + g_{ij}\right) \left(\frac{t_{ij}}{P_j}\right)^{-\sigma} \frac{E_j}{P_j} p_{ij}^{-\sigma-1} = 0 \\ \Rightarrow (1-\sigma) p_{ij}^{-\sigma} = (-\sigma) \left(\frac{w_i}{\varphi} + g_{ij}\right) p_{ij}^{-\sigma-1} \\ \Rightarrow p_{ij}(\varphi) = \frac{\sigma}{\sigma-1} \left(\frac{w_i}{\varphi} + g_{ij}\right) \\ = \frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho} = \frac{1}{\rho} \left(\frac{w_i}{\varphi} + g_{ij}\right) \end{aligned}$$

where $\rho = \frac{\sigma-1}{\sigma}$.

S2.2.2: Variable Profits

We define variable profits (π_{ij}^{Var}) as:

$$\begin{aligned}
\pi_{ij}^{Var}(\varphi) &= p_{ij}(\varphi)q_{ij}(\varphi) - \left(\frac{w_i}{\varphi} + g_{ij}\right) q_{ij}(\varphi) \\
&= \left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}\right) \left[\frac{\left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}\right) t_{ij}}{P_j}\right]^{-\sigma} \frac{E_j}{P_j} - \left(\frac{w_i}{\varphi} + g_{ij}\right) \left[\frac{\left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}\right) t_{ij}}{P_j}\right]^{-\sigma} \frac{E_j}{P_j} \\
&= \left(\frac{\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma} t_{ij}^{-\sigma} E_j - \rho \left(\frac{\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma} t_{ij}^{-\sigma} E_j \\
&= \left(1 - \frac{\sigma - 1}{\sigma}\right) \left(\frac{\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma} t_{ij}^{-\sigma} E_j \\
\Rightarrow \pi_{ij}^{Var}(\varphi) &= \left(\frac{\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma} \frac{t_{ij}^{-\sigma} E_j}{\sigma}.
\end{aligned}$$

S2.3: Equilibrium Conditions

Zero-Profits-Cutoff (ZPC) Conditions

Profits from selling goods in market j ($j = 1, ..., N$) by firm φ in country i is:

$$\pi_{ij}(\varphi) = \left(\frac{\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma} \frac{t_{ij}^{-\sigma} E_j}{\sigma} - w_j \left(A_{ij} + M_{ij}^{-\eta}\right) \tag{6}$$

where, as standard, the first term on the right-hand-side (RHS) is variable profits and the second RHS term is fixed costs. For the ZPC firm φ_{ij}^*:

$$\pi_{ij}(\varphi_{ij}^*) = \left(\frac{\frac{w_i}{\rho\varphi_{ij}^*} + \frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma} \frac{t_{ij}^{-\sigma} E_j}{\sigma} - w_j \left(A_{ij} + M_{ij}^{-\eta}\right) = 0 \quad . \tag{7}$$

We conjecture that:

$$M_{ij} = \alpha_i L_i (\varphi_{ij}^*)^{-\gamma} \tag{8}$$

where γ is the Pareto shape parameter and α_i will be defined later. We will prove this conjecture holds later. Hence, the ZPC productivity level (φ_{ij}^*) is the *implicit* solution to :

$$\left(\frac{\frac{w_i}{\rho\varphi_{ij}^*} + \frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma} \frac{t_{ij}^{-\sigma} E_j}{\sigma} = w_j \left[A_{ij} + (\alpha_i L_i)^{-\eta} (\varphi_{ij}^*)^{\eta\gamma}\right] \tag{9}$$

where we note that P_j is also a function of φ^*_{ij} and w_i and w_j will be determined later using multilateral trade-balance conditions.

S2.4: Solving for $\frac{\partial C_{ij}}{\partial (\varphi^*)^{\sigma-1}} < \frac{\partial R_{ij}}{\partial (\varphi^*)^{\sigma-1}}$

Although we cannot solve explicitly for φ^*_{ij}, we can show the conditions for existence of a finite, unique, and stable cutoff productivity. Let R_{ij} now denote variable profits for firm φ^*_{ij}:

$$R_{ij} = \left(\frac{\frac{w_i}{\rho \varphi^*_{ij}} + \frac{g_{ij}}{\rho}}{P_j} \right)^{1-\sigma} \frac{t_{ij}^{-\sigma} E_j}{\sigma} \tag{10}$$

and let C_{ij} denote export fixed costs:

$$C_{ij} = w_j \left[A_{ij} + (\alpha_i L_i)^{-\eta} \left((\varphi^*_{ij})^{\sigma-1} \right)^{\frac{\gamma\eta}{\sigma-1}} \right]. \tag{11}$$

Since $A_{ij} > 0$, there exists a stable cut-off productivity if $\partial C_{ij}/\partial(\varphi^*_{ij})^{\sigma-1} < \partial R_{ij}/\partial(\varphi^*_{ij})^{\sigma-1}$ when $C_{ij} = R_{ij}$. Solve first for $\partial C_{ij}/\partial(\varphi^*_{ij})^{\sigma-1}$:

$$\begin{aligned} \frac{\partial C_{ij}}{\partial (\varphi^*_{ij})^{\sigma-1}} &= w_j \, (\alpha_i L_i)^{-\eta} \, \frac{\gamma\eta}{\sigma - 1} \left[(\varphi^*_{ij})^{\sigma-1} \right]^{\frac{\gamma\eta}{\sigma-1} - 1} \\ &= w_j \, (\alpha_i L_i)^{-\eta} \, \frac{\gamma\eta}{\sigma - 1} \left[(\varphi^*_{ij})^{\sigma-1} \right]^{\frac{\gamma\eta}{\sigma-1}} \left(\varphi^*_{ij} \right)^{1-\sigma}. \end{aligned}$$

Case #1: Assume $\partial P_j/\partial(\varphi^*_{ij})^{\sigma-1}$=0 .

Then solving

$$\frac{\partial R_{ij}}{\partial (\varphi^*_{ij})^{\sigma-1}} = \frac{t_{ij}^{-\sigma} E_j}{\sigma} \frac{\partial}{\partial (\varphi^*_{ij})^{\sigma-1}} \left(\frac{\frac{w_i}{\rho \varphi^*_{ij}} + \frac{g_{ij}}{\rho}}{P_j} \right)^{1-\sigma}$$

implies

$$\frac{\partial R_{ij}}{\partial (\varphi^*_{ij})^{\sigma-1}} = \frac{t_{ij}^{-\sigma} E_j}{\sigma} (1-\gamma) \left(\frac{\frac{w_i}{\rho \varphi^*_{ij}} + \frac{g_{ij}}{\rho}}{P_j} \right)^{-\sigma} \frac{\partial}{\partial (\varphi^*_{ij})^{\sigma-1}} \left(\frac{\frac{w_i}{\rho \varphi^*_{ij}} + \frac{g_{ij}}{\rho}}{P_j} \right).$$

Solve first for the last derivative on the RHS:

$$\frac{\partial}{\partial (\varphi^*_{ij})^{\sigma-1}} \left(\frac{\frac{w_i}{\rho \varphi^*_{ij}} + \frac{g_{ij}}{\rho}}{P_j} \right) = \frac{P_j \frac{\partial}{\partial (\varphi^*_{ij})^{\sigma-1}} \left(\frac{w_i}{\rho ({\varphi^*_{ij}}^{\sigma-1})^{\frac{1}{\sigma-1}}} + \frac{g_{ij}}{\rho} \right) - \left(\frac{w_i}{\rho \varphi^*_{ij}} + \frac{g_{ij}}{\rho} \right) \frac{\partial P_j}{\partial (\varphi^*_{ij})^{\sigma-1}}}{P_j^2}$$

Assuming $\partial P_j^{\sigma-1}/\partial(\varphi_{ij}^*)^{\sigma-1}=0$:

$$
\begin{aligned}
&= P_j^{-1}\frac{w_i}{\rho}\frac{\partial\left({\varphi_{ij}^*}^{\sigma-1}\right)^{\frac{1}{1-\sigma}}}{\partial\left({\varphi_{ij}^*}^{\sigma-1}\right)} \\
&= \frac{w_i}{\rho P_j}\left(\frac{1}{1-\sigma}\right)\left({\varphi_{ij}^*}^{\sigma-1}\right)^{\frac{1}{1-\sigma}-1} \\
&= \frac{w_i}{\rho P_j}\left(\frac{1}{1-\sigma}\right)\left({\varphi_{ij}^*}^{\sigma-1}\right)^{\frac{1}{1-\sigma}}\left(\varphi_{ij}^*\right)^{1-\sigma} \qquad (12)
\end{aligned}
$$

then:

$$
\frac{\partial R_{ij}}{\partial {\varphi_{ij}^*}^{\sigma-1}} = \frac{t_{ij}^{-\sigma}E_j}{\sigma}(1-\sigma)\left(\frac{\frac{w_i}{\rho\varphi_{ij}^*}+\frac{g_{ij}}{\rho}}{P_j}\right)^{-\sigma}\frac{w_i}{\rho P_j}\left(\frac{1}{1-\sigma}\right)\left({\varphi_{ij}^*}^{\sigma-1}\right)^{\frac{1}{1-\sigma}}\left(\varphi_{ij}^*\right)^{1-\sigma}
$$

$$
\Rightarrow \frac{\partial R_{ij}}{\partial {\varphi_{ij}^*}^{\sigma-1}} = \frac{t_{ij}^{-\sigma}E_j}{\sigma}\left(\frac{\frac{w_i}{\rho\varphi_{ij}^*}+\frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma}\left(\frac{\frac{w_i}{\rho\varphi_{ij}^*}+\frac{g_{ij}}{\rho}}{P_j}\right)^{-1}\left(\frac{\frac{w_i}{\rho\varphi_{ij}^*}}{P_j}\right)\left(\varphi_{ij}^*\right)^{1-\sigma}.
$$

Since, for φ_{ij}^*, $R_{ij}=C_{ij}$:

$$
\frac{\partial R_{ij}}{\partial {\varphi_{ij}^*}^{\sigma-1}} = w_j\left[A_{ij}+(\alpha_i L_i)^{-\eta}\left({\varphi_{ij}^*}^{\sigma-1}\right)^{\frac{\gamma\eta}{\sigma-1}}\right]\left(\frac{\frac{\frac{w_i}{\rho\varphi^*}}{P_j}}{\frac{\frac{w_i}{\rho\varphi^*}+\frac{g_{ij}}{\rho}}{P_j}}\right)\left(\varphi_{ij}^*\right)^{1-\sigma} \qquad (13)
$$

then,

$$
\frac{\partial C_{ij}\left(\varphi_{ij}^*\right)}{\left({\varphi_{ij}^*}^{\sigma-1}\right)} < \frac{\partial R_{ij}\left(\varphi_{ij}^*\right)}{\left({\varphi_{ij}^*}^{\sigma-1}\right)}
$$

$$
\begin{aligned}
\Rightarrow w_j\left(\alpha_i L_i\right)^{-\eta}\left(\frac{\gamma\eta}{\sigma-1}\right)\left({\varphi_{ij}^*}^{\sigma-1}\right)^{\frac{\gamma\eta}{\sigma-1}}\left(\varphi_{ij}^*\right)^{1-\sigma} < \left(\varphi_{ij}^*\right)^{1-\sigma} w_j\left[A_{ij}+(\alpha_i L_i)^{-\eta}\left({\varphi_{ij}^*}^{\sigma-1}\right)^{\frac{\gamma\eta}{\sigma-1}}\right] \\
\times\left(1-\frac{g_{ij}}{\frac{w_i}{\varphi_{ij}^*}+g_{ij}}\right)
\end{aligned}
$$

and the equation simplifies to:

$$
\left(\frac{\gamma\eta}{\sigma-1}\right)s_{ij}\left(\varphi_{ij}^*\right)\left[\frac{1}{1-\frac{g_{ij}}{\frac{w_i}{\varphi_{ij}^*}+g_{ij}}}\right] < 1 \quad .
$$

Hence, if transport costs are a small share of marginal costs, then the stability condition is identical to that in the paper.

Case #2: Assume $\partial P_j/\partial(\varphi_{ij}^*)^{\sigma-1} \neq 0$.

We know from Redding (2011) that

$$P_j = \left\{ \sum_{i=1}^{N} M_i \left(\frac{1 - G(\varphi_{ij}^*)}{1 - G(\varphi_{ii}^*)} \right) \int_{\varphi_{ij}^*}^{\infty} [p_{ij}(\varphi)]^{1-\sigma} \frac{g(\varphi)}{1 - G(\varphi_{ij}^*)} d\varphi \right\}^{\frac{1}{1-\sigma}}$$

where $M_i \left(\frac{1-G(\varphi_{ij}^*)}{1-G(\varphi_{ii}^*)} \right) = M_{ij}$. Substituting in

$$[p_{ij} t_{ij}]^{1-\sigma} = \left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho} \right)^{1-\sigma} t_{ij}^{1-\sigma}$$

in above and using Pareto, then:

$$\begin{aligned} P_j &= \left\{ \sum_{i=1}^{N} M_i \left(\frac{\varphi_{ii}^*}{\varphi_{ij}^*} \right)^{\gamma} t_{ij}^{1-\sigma} \int_{\varphi_{ij}^*}^{\infty} \left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho} \right)^{1-\sigma} \gamma \varphi^{-(\gamma+1)} (\varphi_{ij}^*)^{\gamma} d\varphi \right\}^{\frac{1}{1-\sigma}} \\ &= \left\{ \sum_{i=1}^{N} M_i \left(\frac{\varphi_{ii}^*}{\varphi_{ij}^*} \right)^{\gamma} t_{ij}^{1-\sigma} \left(\varphi_{ij}^*\right)^{\gamma} \gamma \int_{\varphi_{ij}^*}^{\infty} \left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho} \right)^{1-\sigma} \varphi^{-(\gamma+1)} d\varphi \right\}^{\frac{1}{1-\sigma}} . \end{aligned}$$

Solve for:

$$\int_{\varphi_{ij}^*}^{\infty} \left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho} \right)^{1-\sigma} \varphi^{-(\gamma+1)} d\varphi.$$

Use a first-order Taylor-series expansion:

$$f(x) = f(x_0) + \frac{\partial f}{\partial x_0}(x - x_0)$$

where "centered" at x_0. Let

$$x = \left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho} \right)$$

and let the center be $g_{ij} = 0$. Let:

$$f(x) = \left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho} \right)^{1-\sigma} .$$

Then

$$f(x_0) = \left(\frac{w_i}{\rho\varphi} \right)^{1-\sigma}$$

and

$$x - x_0 = \frac{g_{ij}}{\rho}.$$

Then the expansion is

$$f(x) = \left(\frac{w_i}{\rho\varphi}\right)^{1-\sigma} + (1-\sigma)\left(\frac{w_i}{\rho\varphi}\right)^{-\sigma}\frac{g_{ij}}{\rho} \quad .$$

Hence, solve:

$$\int_{\varphi_{ij}^*}^{\infty}\left[\left(\frac{w_i}{\rho\varphi}\right)^{1-\sigma} + (1-\sigma)\left(\frac{w_i}{\rho\varphi}\right)^{-\sigma}\frac{g_{ij}}{\rho}\right]\varphi^{-(\gamma+1)}d\varphi$$

$$= \int_{\varphi_{ij}^*}^{\infty}\left(\frac{w_i}{\rho\varphi}\right)^{1-\sigma}\varphi^{-(\gamma+1)}d\varphi + (1-\sigma)\left(\frac{g_{ij}}{\rho}\right)\int_{\varphi_{ij}^*}^{\infty}\left(\frac{w_i}{\rho\varphi}\right)^{-\sigma}\varphi^{-(\gamma+1)}d\varphi.$$

Solve first the first RHS term:

$$\int_{\varphi_{ij}^*}^{\infty}\left(\frac{w_i}{\rho\varphi}\right)^{1-\sigma}\varphi^{-(\gamma+1)}\partial\varphi$$

$$= \left(\frac{w_i}{\rho}\right)^{1-\sigma}\int_{\varphi_{ij}^*}^{\infty}\varphi^{\sigma-\gamma-2}d\varphi$$

$$= \left(\frac{w_i}{\rho}\right)^{1-\sigma}\frac{1}{-\gamma+(\sigma-1)}\varphi^{-\gamma+(\sigma-1)}\Bigg]_{\varphi_{ij}^*}^{\infty}$$

$$= 0 - \left(\frac{w_i}{\rho}\right)^{1-\sigma}\frac{1}{-[\gamma-(\sigma-1)]}\left(\varphi_{ij}^*\right)^{-[\gamma-(\sigma-1)]}$$

$$= \left(\frac{w_i}{\rho}\right)^{1-\sigma}\frac{1}{\gamma-(\sigma-1)}\left(\varphi_{ij}^*\right)^{-[\gamma-(\sigma-1)]}$$

and recall $\rho = \frac{\sigma-1}{\sigma}$.

Solve next the second RHS term:

$$(1-\sigma)\left(\frac{g_{ij}}{\rho}\right)\int_{\varphi_{ij}^*}^{\infty}\left(\frac{w_i}{\rho\varphi}\right)^{-\sigma}\varphi^{-(\gamma+1)}d\varphi$$

$$= (1-\sigma)\left(\frac{g_{ij}}{\rho}\right)\left(\frac{w_i}{\rho}\right)^{-\sigma}\int_{\varphi_{ij}^*}^{\infty}\varphi^{\sigma-\gamma-1}d\varphi$$

$$= (1-\sigma)\left(\frac{g_{ij}}{\rho}\right)\left(\frac{w_i}{\rho}\right)^{-\sigma}\frac{1}{\sigma-\gamma}\varphi^{\sigma-\gamma}\Bigg]_{p_{ij}^*}^{\infty} .$$

Assuming $\gamma > \sigma$:

$$1-\sigma)\left(\frac{g_{ij}}{\rho}\right)\int_{\varphi_{ij}^*}^{\infty}\left(\frac{w_i}{\rho\varphi}\right)^{-\sigma}\varphi^{-(\gamma+1)}d\varphi = 0 - (1-\sigma)\left(\frac{g_{ij}}{\rho}\right)\left(\frac{w_i}{\rho}\right)^{-\sigma}\frac{1}{-(\gamma-\sigma)}\left(\varphi_{ij}^*\right)^{-(\gamma-\sigma)}$$

$$= (1-\sigma)\frac{1}{\gamma-\sigma}\left(\frac{g_{ij}}{\rho}\right)\left(\frac{w_i}{\rho}\right)^{-\sigma}\left(\varphi_{ij}^*\right)^{-(\gamma-\sigma)} .$$

Combining the terms implies:

$$\int_{\varphi_{ij}^*}^{\infty} \left(\frac{w_i}{\rho\varphi} + \frac{g_{ij}}{\rho}\right)^{1-\sigma} \varphi^{-(\gamma+1)} d\varphi$$

$$\begin{aligned}
&= \left(\frac{w_i}{\rho}\right)^{1-\sigma} \frac{1}{\gamma-(\sigma-1)} \left(\varphi_{ij}^*\right)^{-[\gamma-(\sigma-1)]} + \frac{1-\sigma}{\gamma-\sigma}\left(\frac{g_{ij}}{\rho}\right)\left(\frac{w_i}{\rho}\right)^{-\sigma} \left(\varphi_{ij}^*\right)^{-(\gamma-\sigma)} \\
&= \left(\frac{w_i}{\rho\varphi_{ij}^*}\right)^{1-\sigma} \frac{1}{\gamma-(\sigma-1)} \left(\varphi_{ij}^*\right)^{-\gamma} + \frac{1-\sigma}{\gamma-\sigma}\left(\frac{g_{ij}}{\rho}\right)\left(\frac{w_i}{\rho\varphi_{ij}^*}\right)^{-\sigma} \left(\varphi_{ij}^*\right)^{-\gamma} \\
&= \left(\varphi_{ij}^*\right)^{\gamma} \left(\frac{w_i}{\rho\varphi_{ij}^*}\right)^{1-\sigma} \left[\frac{1}{\gamma-(\sigma-1)} + \frac{1-\sigma}{\gamma-\sigma}\left(\frac{\frac{g_{ij}}{\rho}}{\frac{w_i}{\rho\varphi_{ij}^*}}\right)\right] \\
&= \left(\varphi_{ij}^*\right)^{\gamma} \left(\frac{w_i}{\rho\varphi_{ij}^*}\right)^{1-\sigma} \frac{1}{\gamma-(\sigma-1)} \left[1 - \frac{[\gamma-(\sigma-1)](\sigma-1)}{\gamma-\sigma}\left(\frac{g_{ij}}{\frac{w_i}{\varphi_{ij}^*}}\right)\right].
\end{aligned}$$

Substituting above into P_j earlier yields:

$$P_j^{1-\sigma} = \sum_{i=1}^{N} M_i \left(\frac{\varphi_{ii}^*}{\varphi_{ij}^*}\right)^{\gamma} \left(\frac{w_i}{\rho\varphi_{ij}^*}\right)^{1-\sigma} t_{ij}^{1-\sigma} \frac{\gamma}{\gamma-(\sigma-1)} \left[1 - \phi\frac{g_{ij}}{w_i\varphi_{ij}^*}\right]$$

where

$$\phi = \frac{[\gamma-(\sigma-1)](\sigma-1)}{\gamma-\sigma} > 0 \quad .$$

Now solve for $\frac{\partial P_j}{\partial(\varphi_{ij}^*)^{\sigma-1}}$:

$$\frac{\partial P_j}{\partial(\varphi_{ij}^*)^{\sigma-1}} = \frac{\partial}{\partial(\varphi_{ij}^*)^{\sigma-1}} \left\{\sum_{i=1}^{N} M_i \left(\frac{\varphi_{ii}^*}{\varphi_{ij}}\right)^{\gamma} \left(\varphi_{ij}^*\right)^{\sigma-1} \left(\frac{w_i t_{ij}}{\rho}\right)^{1-\sigma} \frac{\gamma}{\gamma-(\sigma-1)} \left[1 - \phi\frac{g_{ij}}{w_i/\varphi_{ij}^*}\right]\right\}^{\frac{1}{1-\sigma}} .$$

using $M_i = \alpha_i L_i(\varphi_{ii}^*)^{-\gamma}$, then

$$P_i = \left\{\sum_{i=1}^{N} \alpha_i L_i \left(\varphi_{ij}^*\right)^{-[\gamma-(\sigma-1)]} \left(\frac{\gamma}{\gamma-(\sigma-1)}\right) \left(\frac{w_i t_{ij}}{\rho}\right)^{1-\sigma} \left[1 - \phi\frac{g_{ij}}{w_i/\varphi_{ij}^*}\right]\right\}^{\frac{1}{1-\sigma}} .$$

Then:

$$\begin{aligned}
\frac{\partial P_j}{\partial(\varphi_{ij}^*)^{\sigma-1}} = \frac{1}{1-\sigma} \Bigg\{ &\alpha_i L_i \left(\frac{\gamma}{\gamma-(\sigma-1)}\right)\left(\frac{w_i t_{ij}}{\rho}\right)^{1-\sigma} \frac{\partial\left[(\varphi_{ij}^*)^{-\gamma+(\sigma-1)}\right]}{\partial(\varphi_{ij}^*)^{\sigma-1}} \\
&- \phi\frac{g_{ij}}{w_i}\alpha_i L_i \left(\frac{\gamma}{\gamma-(\sigma-1)}\right)\left(\frac{w_i t_{ij}}{\rho}\right)^{1-\sigma} \frac{\partial\left[(\varphi_{ij}^*)^{1-\gamma+(\sigma-1)}\right]}{\partial(\varphi_{ij}^*)^{\sigma-1}} \Bigg\}^{\frac{1}{1-\sigma}-1}
\end{aligned}$$

$$= \frac{1}{1-\sigma} P_j \left(\frac{\gamma}{\gamma-(\sigma-1)} \right) \alpha_i L_i \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma}$$
$$\times \left\{ \left(-\frac{\gamma}{\sigma-1} + 1 \right) \left({\varphi_{ij}^*}^{\sigma-1} \right)^{-\frac{\gamma}{\sigma-1}} - \phi \frac{g_{ij}}{w_i} \left(\frac{1-\alpha}{\sigma-1} + 1 \right) \left({\varphi_{ij}^*}^{\sigma-1} \right)^{\frac{1-\gamma}{\sigma-1}} \right\}^{\frac{-\gamma}{\sigma-1}}$$
$$\times \left\{ \sum_{i=1}^{N} \alpha_i L_i \left(\frac{\gamma}{\gamma-(\sigma-1)} \right) \left(\varphi_{ij}^* \right)^{-\gamma} \left(\varphi_{ij}^* \right)^{\sigma-1} \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left[1 - \phi \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right] \right\}^{-1}$$

$$= \frac{1}{1-\sigma} P_j \frac{\left\{ \frac{\gamma}{\gamma-(\sigma-1)} \alpha_i L_i \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left(\varphi_{ij}^* \right)^{-\gamma} \left(-\frac{[\gamma-(\sigma-1)]}{\sigma-1} - \frac{[\gamma-(\sigma-1)](\sigma-1)}{\gamma-\sigma} \left(\frac{1-\gamma+\sigma-1}{\sigma-1} \right) \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right) \right\}}{\left\{ \sum_{i=1}^{N} \left(\frac{\gamma}{\gamma-(\sigma-1)} \right) \alpha_i L_i \left(\varphi_{ij}^* \right)^{-\gamma+(\sigma-1)} \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left[1 - \phi \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right] \right\}}$$

$$= \frac{P_j}{1-\sigma} \frac{\left\{ \frac{\gamma}{\gamma-(\sigma-1)} \alpha_i L_i \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left(\varphi_{ij}^* \right)^{-\gamma} \left(-\frac{[\gamma-(\sigma-1)]}{\sigma-1} + [\gamma-(\sigma-1)] \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right) \right\}}{\left\{ \sum_{i=1}^{N} \left(\frac{\gamma}{\gamma-(\sigma-1)} \right) \alpha_i L_i \left(\varphi_{ij}^* \right)^{-\gamma+(\sigma-1)} \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left[1 - \frac{[\gamma-(\sigma-1)](\sigma-1)}{\gamma-\sigma} \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right] \right\}}$$

Substituting above for $\frac{\partial P_j}{\partial (\varphi_{ij}^*)^{\sigma-1}}$ in the last equation on page 5 earlier, then:

$$\frac{\partial}{\partial \left(\varphi^* \right)^{\sigma-1}} \left(\frac{\frac{w_i}{\rho \varphi_{ij}^*} + \frac{g_{ij}}{\rho}}{P_j} \right) = \frac{w_i}{\rho \varphi_{ij}^* P_j} \left(\frac{1}{1-\sigma} \right) \left(\varphi_{ij}^* \right)^{1-\sigma} + \frac{\frac{w_i}{\rho \varphi_{ij}^*} + \frac{g_{ij}}{\rho}}{P_j} \left(\frac{1}{1-\sigma} \right)$$
$$\times \frac{\left\{ \frac{\gamma}{(\sigma-1)} \alpha_i L_i \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left(\varphi_{ij}^* \right)^{-\gamma} \left(1 - (\sigma-1) \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right) \right\}}{\sum_{i=1}^{N} \left(\frac{\gamma}{\gamma-(\sigma-1)} \right) \alpha_i L_i \left(\varphi_{ij}^* \right)^{-\gamma+(\sigma-1)} \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left[1 - \frac{[\gamma-(\sigma-1)](\sigma-1)}{\gamma-\sigma} \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right]}$$

Then substituting this expression into the previous equation (second to last) on page 5 yields:

$$\frac{\partial R_{ij}}{\partial \left(\varphi_{ij}^* \right)^{\sigma-1}} = \frac{t_{ij}^{-\sigma} E_j}{\sigma} (1-\sigma) \left(\frac{\frac{w_i}{\rho \varphi_{ij}^*} + \frac{g_{ij}}{\rho}}{P_j} \right)^{-\sigma}$$
$$\times \frac{1}{1-\sigma} \left\{ \frac{w_i}{\rho \varphi_{ij}^* P_j} \left(\varphi_{ij}^* \right)^{1-\sigma} + \left(\frac{\frac{w_i}{\rho \varphi_{ij}^*} + \frac{g_{ij}}{\rho}}{P_j} \right) \left(\varphi_{ij}^* \right)^{1-\sigma} \right.$$
$$\left. \times \frac{\left\{ \frac{\gamma}{(\sigma-1)} \alpha_i L_i \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left(\varphi_{ij}^* \right)^{-\gamma+(\sigma-1)} \left(1 - (\sigma-1) \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right) \right\}}{\sum_{i=1}^{N} \left(\frac{\gamma}{\gamma-(\sigma-1)} \right) \alpha_i L_i \left(\frac{w_i t_{ij}}{\rho} \right)^{1-\sigma} \left(\varphi_{ij}^* \right)^{-\gamma+(\sigma-1)} \left[1 - \frac{[\gamma-(\sigma-1)](\sigma-1)}{\gamma-\sigma} \frac{g_{ij}}{w_i/\varphi_{ij}^*} \right]} \right\}$$

$$\frac{\partial R_{ij}}{\partial\left(\varphi_{ij}^{*}\right)^{\sigma-1}} = \frac{t_{ij}^{-\sigma}E_j}{\sigma}\left(\frac{\frac{w_i}{\rho\varphi_{ij}^{*}}+\frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma}\left(\varphi_{ij}^{*}\right)^{1-\sigma}$$
$$\times\left\{\frac{\frac{w_i}{\rho\varphi_{ij}^{*}}}{\frac{w_i}{\rho\varphi_{ij}}+\frac{g_{ij}}{\rho}}+\left(\frac{\gamma}{\sigma-1}-1\right)\right.$$
$$\left.\times\underbrace{\frac{\left\{\alpha_i L_i\left(\frac{w_i t_{ij}}{\rho\varphi_{ij}^{*}}\right)^{1-\sigma}\left(\varphi_{ij}^{*}\right)^{-\gamma}\left(1-(\sigma-1)\frac{g_{ij}}{w_i/\varphi_{ij}^{*}}\right)\right\}}{\sum_{i=1}^{N}\alpha_i L_i\left(\frac{w_i t_{ij}}{\rho\varphi_{ij}^{*}}\right)^{1-\sigma}\left(\varphi_{ij}^{*}\right)^{-\gamma}\left[1-\left(1+\frac{1}{\gamma-\sigma}\right)(\sigma-1)\frac{g_{ij}}{w_i/\varphi_{ij}^{*}}\right]}}_{\left(\frac{\gamma}{\sigma-1}-1\right)\widetilde{\theta}_{ij}(\varphi_{ij}^{*})}\right\}$$

$$\frac{\partial R_{ij}}{\partial\left(\varphi_{ij}^{*}\right)^{\sigma-1}} = \frac{t_{ij}^{-\sigma}E_j}{\sigma}\left(\frac{\frac{w_i}{\rho\varphi_{ij}^{*}}+\frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma}\left(\varphi_{ij}^{*}\right)^{1-\sigma}$$
$$\times\left\{\frac{\frac{w_i}{\rho\varphi_{ij}^{*}}}{\frac{w_i}{\rho\varphi_{ij}}+\frac{g_{ij}}{\rho}}+\left(\frac{\gamma}{\sigma-1}-1\right)\tilde{\theta}_{ij}(\varphi_{ij}^{*})\right\}$$

Solving for $\frac{\partial C_{ij}}{\partial\left(\varphi_{ij}^{*}\right)^{\sigma-1}} < \frac{\partial R_{ij}}{\partial\left(\varphi_{ij}^{*}\right)^{\sigma-1}}$ at $R_{ij}(\varphi_{ij}^{*}) = C_{ij}(\varphi_{ij}^{*})$ yields:

$$w_j\left(\alpha_i L_i\right)^{-\eta}\left(\frac{\gamma\eta}{\sigma-1}\right)\left(\varphi_{ij}^{*\,\sigma-1}\right)^{\frac{\gamma\eta}{\sigma-1}}\left(\varphi_{ij}^{*}\right)^{1-\sigma}$$
$$< \frac{t_{ij}^{-\sigma}E_j}{\sigma}\left(\frac{\frac{w_i}{\rho\varphi_{ij}^{*}}+\frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma}\left(\varphi_{ij}^{*}\right)^{1-\sigma}\left\{\frac{\frac{w_i}{\rho\varphi_{ij}^{*}}}{\frac{w_i}{\rho\varphi_{ij}^{*}}+\frac{g_{ij}}{\rho}}+\left(\frac{\gamma}{\sigma-1}-1\right)\tilde{\theta}_{ij}\right\}.$$

Since $R_{ij}(\varphi_{ij}^{*}) = C_{ij}(\varphi_{ij}^{*})$, then we can substitute

$$w_j\left[A_{ij}+\left(\alpha_i L_i\right)^{-\eta}\left(\left(\varphi_{ij}^{*}\right)^{\sigma-1}\right)^{\frac{\gamma\eta}{\sigma-1}}\right]$$

for

$$\frac{t_{ij}^{-\sigma}E_j}{\sigma}\left(\frac{\frac{w_i}{\rho\varphi_{ij}^{*}}+\frac{g_{ij}}{\rho}}{P_j}\right)^{1-\sigma}$$

to yield:

$$
\begin{aligned}
& w_j(\alpha_i L_i)^{-\eta}\frac{\gamma\eta}{\sigma-1}\left[\left(\varphi^*_{ij}\right)^{\sigma-1}\right]^{\frac{\gamma\eta}{\sigma-1}}\left(\varphi^*_{ij}\right)^{1-\sigma} \\
& < w_j\left[A_{ij}+(\alpha_i L_i)^{-\eta}\left(\left(\varphi^*_{ij}\right)^{\sigma-1}\right)^{\frac{\gamma\eta}{\sigma-1}}\right]\left(\varphi^*_{ij}\right)^{1-\sigma}\left\{\frac{mc^P(\varphi^*_{ij})}{mc(\varphi^*_{ij})}+\left(\frac{\gamma}{\sigma-1}-1\right)\widetilde{\theta}_{ij}\right\} \\
& \Rightarrow \left(\frac{\gamma\eta}{\sigma-1}\right)s_{ij}(\varphi^*_{ij})\left(\frac{1}{\frac{mc^P(\varphi^*_{ij})}{mc(\varphi^*_{ij})}+\left(\frac{\gamma}{\sigma-1}-1\right)\widetilde{\theta}_{ij}(\varphi^*_{ij})}\right)<1
\end{aligned}
$$

where mc^P is marginal production costs and mc is marginal costs. In the case that g_{ij} is a small share of marginal costs and $\tilde{\theta}_{ij}$ are close to zero, then the stability condition is the same as in the paper, $\left(\frac{\gamma\eta}{\sigma-1}\right)s_{ij}(\varphi^*_{ij})<1$.

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