Web Appendix
Derivation of Pricing Equation

To derive the pricing equation in (6), we rely on firms' markup pricing rules. The markup $\mu_i^l = \varepsilon_i^l / \left(\varepsilon_i^l - 1\right)$ can be calculated easily from the price elasticity in equation (4) as:

$$\mu_i^l = \frac{p_i^l \left(1 - \frac{\beta}{\gamma+\beta(m^t+m^n)}\right)}{p_i^l \left(2 - \frac{\beta}{\gamma+\beta(m^t+m^n)}\right) - \left(\frac{\alpha\gamma}{\gamma+\beta(m^t+m^n)} + \frac{\beta}{\gamma+\beta(m^t+m^n)} \left(\sum_{j=1}^{m^t} p_j^t + \sum_{j=1}^{m^n} p_j^n\right)\right)} \tag{A.1}$$

Substituting the expression for the markup μ_i^l in equation (A.1) into the markup pricing equation, $p_i^l = \mu_i^l \frac{c_i^l}{\varphi_i^l}$, leads to the following equation:

$$p_i^l \frac{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} - \left(\frac{\alpha\gamma + \beta\left(\sum_{j=1}^{m^t} p_j^t + \sum_{j=1}^{m^n} p_j^n\right)}{\gamma + \beta\left(m^t + m^n\right)}\right) = \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} \frac{c_i^l}{\varphi_i^l} \tag{A.2}$$

Combining equation (A.2) with an identical expression for p_j^l gives:

$$\begin{aligned} & p_i^l \frac{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} - \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} \frac{c_i^l}{\varphi_i^l} \\ = & p_j^l \frac{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} - \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} \frac{c_j^l}{\varphi_j^l} \end{aligned} \tag{A.3}$$

Solving equation (A.3) for p_j^l leads to equation (5) in the main text. Finally, substituting equation (5) into equation (A.2) leads to equation (6) in the main text.[11]

Additional Derivations for Main Model

In this section we derive the expression for demand in equation (3) and the pricing equation in (6). We start with the first equation. Maximizing utility in equation (1) subject to the budget constraint $\sum_{j=1}^{m^t} p_j^t q_j^t + \sum_{j=1}^{m^n} p_j^n q_j^n + q_0^t = I$ and the condition that demand is positive for all goods generates the following Lagrangian:

$$\begin{aligned} L = {} & q_0^t + \alpha\left(\sum_{j=1}^{m^t} q_j^t + \sum_{j=1}^{m^n} q_j^n\right) - \frac{1}{2}\gamma\left(\sum_{j=1}^{m^t}\left(q_j^t\right)^2 + \sum_{j=1}^{m^n}\left(q_j^n\right)^2\right) - \frac{1}{2}\beta\left(\sum_{j=1}^{m^t} q_j^t + \sum_{j=1}^{m^n} q_j^n\right)^2 \\ & - \lambda\left(\sum_{j=1}^{m^t} p_j^t q_j^t + \sum_{j=1}^{m^n} p_j^n q_j^n + q_0^t - I\right) + \mu_0^t C_0^t + \sum_{j=1}^{m^t} \mu_j^t q_j^t + \sum_{j=1}^{m^n} \mu_j^n C_j^n \end{aligned}$$

[11] Additional derivations available upon request.

Maximizing leads to the following Kuhn-Tucker conditions:

$$1-\lambda+\mu_0^t=0$$
$$\alpha-\gamma q_i^l-\beta\left(\sum_{j=1}^{m^t}q_j^t+\sum_{j=1}^{m^n}q_j^n\right)-\lambda p_i^l+\mu_i^l=0;\ l=T,NT$$

We assume that consumers have positive demand for all goods. This corresponds to:

$$\lambda=1 \tag{A.4}$$
$$p_i^l=\alpha-\gamma q_i^l-\beta\left(\sum_{j=1}^{m^t}q_j^t+\sum_{j=1}^{m^n}q_j^n\right) \tag{A.5}$$
$$q_0^t=I-\sum_{j=1}^{m^t}p_j^tq_j^t+\sum_{j=1}^{m^n}p_j^nq_j^n>0 \tag{A.6}$$

Combining equation (A.5) with a similar expression for firm j gives:

$$q_j^l=\frac{p_i^l-p_j^l}{\gamma}+q_i^l \tag{A.7}$$

Summing demand in equation (A.7) over all tradables and non-tradables gives:

$$\sum_{j=1}^{m^t}q_j^t+\sum_{j=1}^{m^n}q_j^n=\sum_{j=1}^{m^t}\left(\frac{p_i^l-p_j^t}{\gamma}+q_i^l\right)+\sum_{j=1}^{m^n}\left(\frac{p_i^l-p_j^n}{\gamma}+q_i^l\right) \tag{A.8}$$
$$\sum_{j=1}^{m^t}q_j^t+\sum_{j=1}^{m^n}q_j^n=\frac{m^t+m^n}{\gamma}p_i^l-\frac{1}{\gamma}\left(\sum_{j=1}^{m^t}p_j^t+\sum_{j=1}^{m^n}p_j^n\right)+\left(m^t+m^n\right)q_i^l \tag{A.9}$$

Substituting equation (A.9) into equation (A.5) gives:

$$p_i^l=\alpha-\gamma q_i^l-\beta\left(\frac{m^t+m^n}{\gamma}p_i^l-\frac{1}{\gamma}\left(\sum_{j=1}^{m^t}p_j^t+\sum_{j=1}^{m^n}p_j^n\right)+\left(m^t+m^n\right)q_i^l\right) \tag{A.10}$$

Solving for q_m^l leads to:

$$q_i^l\left(\gamma+\beta\left(m^t+m^n\right)\right)=\alpha-\frac{\beta\left(m^t+m^n\right)+\gamma}{\gamma}p_i^l+\frac{\beta}{\gamma}\left(\sum_{j=1}^{m^t}p_j^t+\sum_{j=1}^{m^n}p_j^n\right)$$

$$q_i^l=\frac{\alpha}{\gamma+\beta\left(m^t+m^n\right)}-\frac{1}{\gamma}p_i^l+\frac{1}{\gamma+\beta\left(m^t+m^n\right)}\frac{\beta}{\gamma}\left(\sum_{j=1}^{m^t}p_j^t+\sum_{j=1}^{m^n}p_j^n\right) \tag{A.11}$$

Next, we derive the pricing equation in (6). Substituting equation (5) into equation (A.2), both for p_j^t and p_j^n as a function of p_i^l, leads to:

$$p_i^l \frac{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} = \frac{\alpha\gamma + \beta \sum_{j=1}^{m^t} \left(p_i^l + \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}\left(\frac{c_j^t}{\varphi_j^t} - \frac{c_i^l}{\varphi_i^l}\right)\right)}{\gamma + \beta\left(m^t + m^n\right)} + \frac{\alpha\gamma + \beta \sum_{j=1}^{m^n} \left(p_i^l + \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}\left(\frac{c_j^n}{\varphi_j^n} - \frac{c_i^l}{\varphi_i^l}\right)\right)}{\gamma + \beta\left(m^t + m^n\right)} + \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} \frac{c_i^l}{\varphi_i^l}$$

Solving for p_i^l and rearranging leads to equation (6) in the main text:

$$p_i^l \frac{2\gamma + \beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)} = \frac{\alpha\gamma + \beta \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}\left(\sum_{j=1}^{m^t} \frac{c_j^t}{\varphi_j^t} + \sum_{j=1}^{m^n} \frac{c_j^n}{\varphi_j^n}\right)}{\gamma + \beta\left(m^t + m^n\right)} + \left(\frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{\gamma + \beta\left(m^t + m^n\right)}\left(1 - \frac{\beta\left(m^t + m^n\right)}{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}\right)\right) \frac{c_i^l}{\varphi_i^l}$$

$$p_i^l = \frac{\alpha\gamma + \beta \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}\left(\sum_{j=1}^{m^t} \frac{c_j^t}{\varphi_j^t} + \sum_{j=1}^{m^n} \frac{c_j^n}{\varphi_j^n}\right)}{2\gamma + \beta\left(m^t + m^n\right) - \beta} + \left(\frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{2\gamma + \beta\left(m^t + m^n\right) - \beta}\left(\frac{2\gamma + \beta\left(m^t + m^n\right) - \beta}{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}\right)\right) \frac{c_i^l}{\varphi_i^l}$$

$$p_i^l = \frac{\alpha\gamma + \beta \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{2\gamma + 2\beta\left(m^t + m^n\right) - \beta}\left(\sum_{j=1}^{m^t} \frac{c_j^t}{\varphi_j^t} + \sum_{j=1}^{m^n} \frac{c_j^n}{\varphi_j^n}\right)}{2\gamma + \beta\left(m^t + m^n\right) - \beta} + \frac{\gamma + \beta\left(m^t + m^n\right) - \beta}{2\gamma + 2\beta\left(m^t + m^n\right) - \beta} \frac{c_i^l}{\varphi_i^l}$$

Extended Model

Differential Productivity Growth

We first work out the case with differential productivity growth in homogeneous and differentiated tradables, still working with an integrated labor market. We include country indices to evaluate the impact of country size and the relative size of the tradables sector. There are J countries. Each country j sources tradables from all trading partners $i = 1,..,J$ and non-tradables from itself. We have the following pricing expressions:

$$p_{ij}^t = \frac{\alpha\gamma + \beta\frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\left(\sum_{k=1}^{J} m_k^t \frac{c_k^t}{\varphi_k^t} + m_j^n \frac{c_j^n}{\varphi_j^n}\right)}{2\gamma+\beta\left(m^t+m_j^n\right)-\beta} + \frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\frac{c_i^t}{\varphi_i^t}; j = 1,..,J \tag{A.12}$$

$$p_j^n = \frac{\alpha\gamma + \beta\frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\left(\sum_{k=1}^{J} m_k^t \frac{c_k^t}{\varphi_k^t} + m_j^n \frac{c_j^n}{\varphi_j^n}\right)}{2\gamma+\beta\left(m^t+m_j^n\right)-\beta} + \frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\frac{c_j^n}{\varphi_j^n} \tag{A.13}$$

m_j^t and m_j^n are respectively the number of tradables and non-tradables produced in country j and $m^t = \sum_{k=1}^{J} m_k^t$ is the number of tradables sourced from all trading partners k. We concentrate on changes in productivity in importing country j and keep productivity levels constant in the other countries.

We abstract from the second component of the BS effect, the larger labor share in non-tradables than in tradables, since it has the same impact as the first component, differential productivity growth. So there is only one production factor, labor. Productivity growth in non-tradables and tradables is denoted as before by respectively g^n and g^t. Productivity growth of homogeneous tradables is defined as g^h. If the labor market is integrated across the different sectors, the relative change in the price of input bundles (wages) is equal to $-g^h$. The homogeneous good can still serve as numeraire. If it is freely traded and country j is small on the world market, the price of the homogeneous good is given. Therefore, productivity growth in this sector leads to a proportional fall in wages.

Log differentiating the expressions for p_{ij}^t and p_j^n in (A.12) and (A.13) generates:

$$\widehat{p_{ij}^t} = \frac{\frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\frac{\beta}{2\gamma+\beta\left(m^t+m_j^n\right)-\beta}}{p_{ij}^t}\left(m_j^t\frac{c_i^t}{\varphi_i^t}\left(g^h-g^t\right)+m_j^n\frac{c_j^n}{\varphi_j^n}\left(g^h-g^n\right)\right) \tag{A.14}$$

$$\widehat{p_j^n} = \frac{\frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}}{p_j^n}\left(\frac{\beta}{2\gamma+\beta\left(m^t+m_j^n\right)-\beta}\left(m_j^t\frac{c_i^t}{\varphi_i^t}\left(g^h-g^t\right)+m_j^n\frac{c_j^n}{\varphi_j^n}\left(g^h-g^n\right)\right)+\left(g^h-g^n\right)\right) \tag{A.15}$$

Equations (A.14) shows that the price of tradables rises unambiguously if $g^h > g^t > g^n$. Empirical evidence provides support for these assumptions. As discussed in the main text, productivity growth of tradables is larger than productivity growth of non-tradables, $g^t > g^n$. **?** find that productivity growth in agriculture has been much larger than in manufacturing in a large cross-section of countries. Interpreting homogeneous tradables as agricultural goods and differentiated tradables as manufactures, this implies that $g^h > g^t$.

With $g^t > g^h > g^n$ the change in the price of tradables is ambiguous. The term in $g^h - g^t$ is negative and the term in $g^h - g^n$ is positive. The first term reflects the fact that productivity growth in differentiated tradables is larger than in homogeneous tradables, $g^t > g^n$. This implies that productivity of differentiated tradables falls more than wages. So, its costs fall. This drives down the prices of domestic tradables and through strategic complementarity this also drives down the price of imported tradables. The second term reflects $g^h > g^n$. The costs of producing non-tradables rise and this drives up the price of imported tradables through strategic complementarity. So in this second case the overall effect is ambiguous and determined by the size of the productivity differences, the size of the non-tradables sector relative to the tradables sector and the size of domestically consumed tradables relative to imported tradables. We can observe that for a small economy, the share of tradables sourced domestically is negligible. This implies that the first term between brackets vanishes. So, prices of imported tradables will rise as a result even with $g^t > g^h$.

Segmented Labor Markets

We can go one step further and assume that the factor markets for differentiated goods and for homogeneous goods are perfectly segmented, so that productivity growth in the homogeneous sector does not drive the price of factor inputs anymore. To determine equilibrium wages w_i, we need to define a labor market equilibrium condition. The other endogenous variables are determined by the $(J+1)\,J$ pricing equations in $(J+1)\,J$ prices, p_{ij}^t, p_j^n for all i and all j:

$$p_{ij}^t = \frac{\alpha\gamma + \beta\frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\left(\sum_{k=1}^{J} m_k^t \frac{w_k}{\varphi_k^t} + m_j^n \frac{w_j}{\varphi_j^n}\right)}{2\gamma+\beta\left(m^t+m_j^n\right)-\beta} + \frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\frac{w_i}{\varphi_i^t}; j = 1, .., J \tag{A.16}$$

$$p_j^n = \frac{\alpha\gamma + \beta\frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\left(\sum_{k=1}^{J} m_k^t \frac{w_k}{\varphi_k^t} + m_j^n \frac{w_j}{\varphi_j^n}\right)}{2\gamma+\beta\left(m^t+m_j^n\right)-\beta} + \frac{\gamma+\beta\left(m^t+m_j^n\right)-\beta}{2\gamma+2\beta\left(m^t+m_j^n\right)-\beta}\frac{w_j}{\varphi_j^n} \tag{A.17}$$

The labor market equilibrium is given by the following expression:

$$L_i = \sum_{j=1}^{J} q_{ij}^t \frac{w_i}{\varphi_i^t} + q_i^n \frac{w_i}{\varphi_i^n} \tag{A.18}$$

The expressions for q_{ij}^t and q_i^n are given by:

$$q_{ij}^t = \frac{\alpha}{\gamma+\beta\left(m^t+m_j^n\right)} - \frac{1}{\gamma}p_{ij}^t + \frac{\beta}{\gamma+\beta\left(m^t+m_j^n\right)}\frac{\left(\sum_{k=1}^{J} m_k^t p_{kj}^t + m_j^n p_j^n\right)}{\gamma} \tag{A.19}$$

$$q_i^n = \frac{\alpha}{\gamma+\beta\left(m^t+m_j^n\right)} - \frac{1}{\gamma}p_i^n + \frac{\beta}{\gamma+\beta\left(m^t+m_j^n\right)}\frac{\left(\sum_{k=1}^{J} m_k^t p_{kj}^t + m_j^n p_j^n\right)}{\gamma} \tag{A.20}$$

Substituting equations (A.19)-(A.20) into (A.18) gives the following labor market equilibrium condition:

$$\begin{aligned} L_i = & \sum_{j=1}^{J}\left(\frac{\alpha}{\gamma+\beta\left(m^t+m_j^n\right)} - \frac{1}{\gamma}p_{ij}^t + \frac{\beta}{\gamma+\beta\left(m^t+m_j^n\right)}\frac{\left(\sum_{k=1}^{J} m_k^t p_{kj}^t + m_j^n p_j^n\right)}{\gamma}\right)\frac{w_i}{\varphi_i^t} \\ & + \left(\frac{\alpha}{\gamma+\beta\left(m^t+m_j^n\right)} - \frac{1}{\gamma}p_i^n + \frac{\beta}{\gamma+\beta\left(m^t+m_j^n\right)}\frac{\left(\sum_{k=1}^{J} m_k^t p_{kj}^t + m_j^n p_j^n\right)}{\gamma}\right)\frac{w_i}{\varphi_i^n} \end{aligned} \tag{A.21}$$

Hence, to simulate the model we solve the $(J+1)\,J$ pricing equations (A.16)-(A.17) and J labor market conditions (A.21) for $(J+1)\,J$ prices p_{ij}^t and p_j^n and J wages w_i. The number of firms m_k^t and m^n are exogenously given, i.e. we do not work with a free entry condition. This

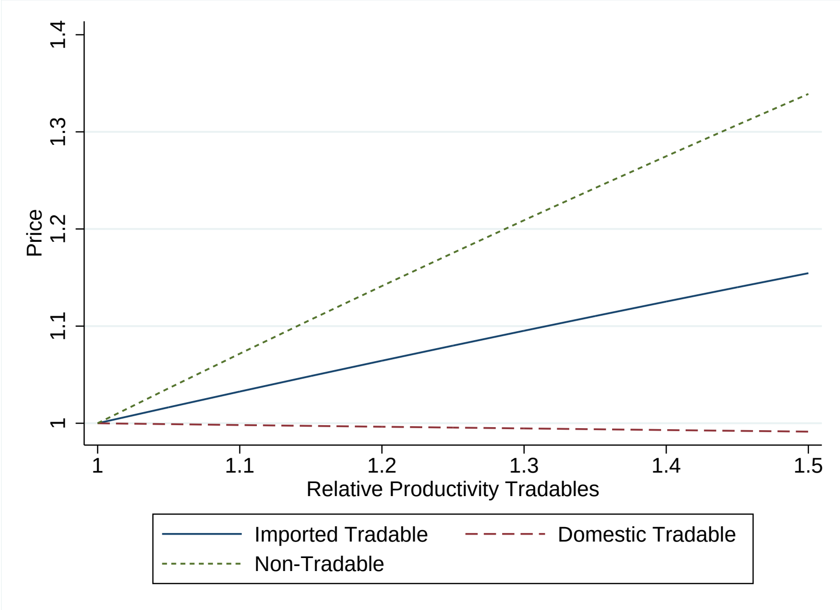

Figure 1: The price of imported tradables, domestic tradables and non-tradables as a function of relative productivity of tradables

would further endogenize the model.

As a baseline, we work with 5 identical countries, with 20 tradables firms and 20 non-tradables firms and a labor force of 10 in each country, i.e. $J = 5$, $m_j^t = m_j^n = 20$ and $L_j = 5$ for all j. Productivity is equal in all countries and all sectors, $\varphi_j^t = \varphi_j^n = 2$ for all j. Finally, α, γ and β are set respectively at 5, 1 and 1. To mimic the BS effect, productivity in the tradables sector is increased in one of the countries.[12] Figure 1 displays for the country with rising productivity of tradables the average price of imported tradables (from all its trading partners), the price of domestic tradables and the price of non-tradables as a function of the productivity of tradables relative to non-tradables. We express prices relative to the level where productivity in the two sectors is equal. As expected, the price of domestic tradables falls somewhat, the price of non-tradables rises most and the price of imported tradables rises as well when productivity in the tradables sector rises. An increasing productivity of tradables raises wages and therefore the price of domestic tradables only falls slightly as a result of the productivity increase. As a result of the wage increase the price of non-tradables rises and because of strategic complementarity the price of imported tradables rises in turn.

Figure 2 exposes the average price of imported tradables in the country with rising productivity as a function of the relative productivity of tradables and the number of tradables relative to non-tradables. In the simulations underneath this figure the number of non-tradables

[12] GAMS code is available upon request.

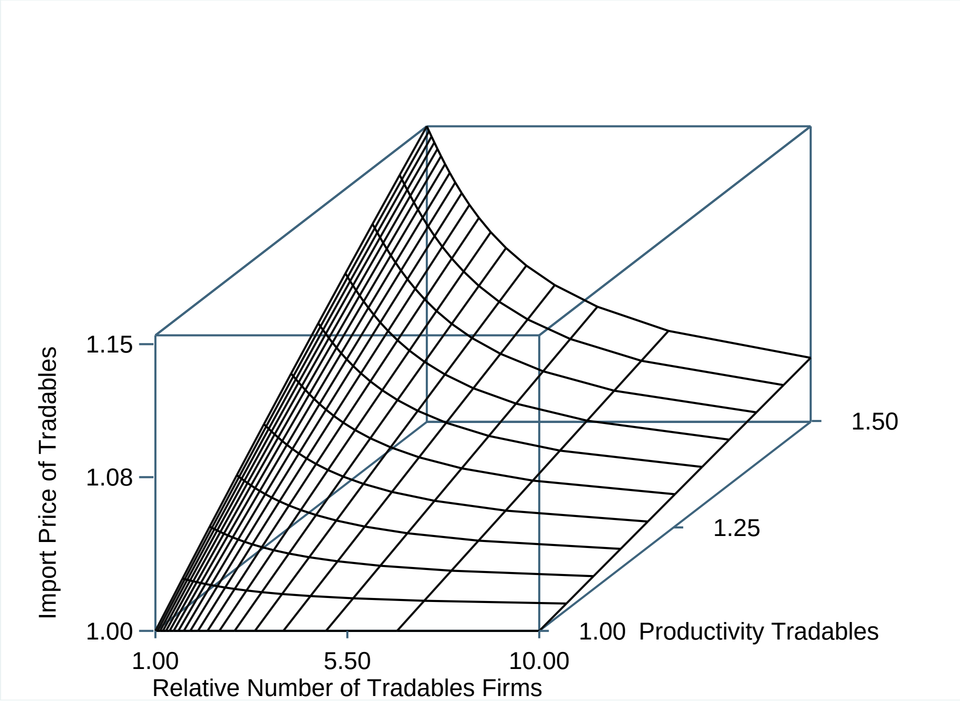

Figure 2: The price of imported tradables as a function of relative productivity of tradables and the number of tradables relative to non-tradables firms

was reduced keeping the number of non-tradables constant. The figure clearly shows that the increase in the price of imported tradables is weaker when the number of tradables is larger. With a larger number of tradables, the price increase of non-tradables has a smaller impact on the price of imported tradables and the price drop of domestic tradables a larger impact. As a result the average price of tradables does not rise so much.

Figure 3 displays the average price of imported tradables in the country with rising productivity as a function of the relative productivity of tradables and the number of countries in the economy. With a smaller number of countries the BS effect on the price of imported tradables is again weaker. The reason is that with less countries, the number of non-tradables is smaller relative to the number of domestic tradables. Therefore, the drop in price of domestic tradables has a bigger impact and the rise in prices of non-tradables a smaller impact on the price of imported tradables.

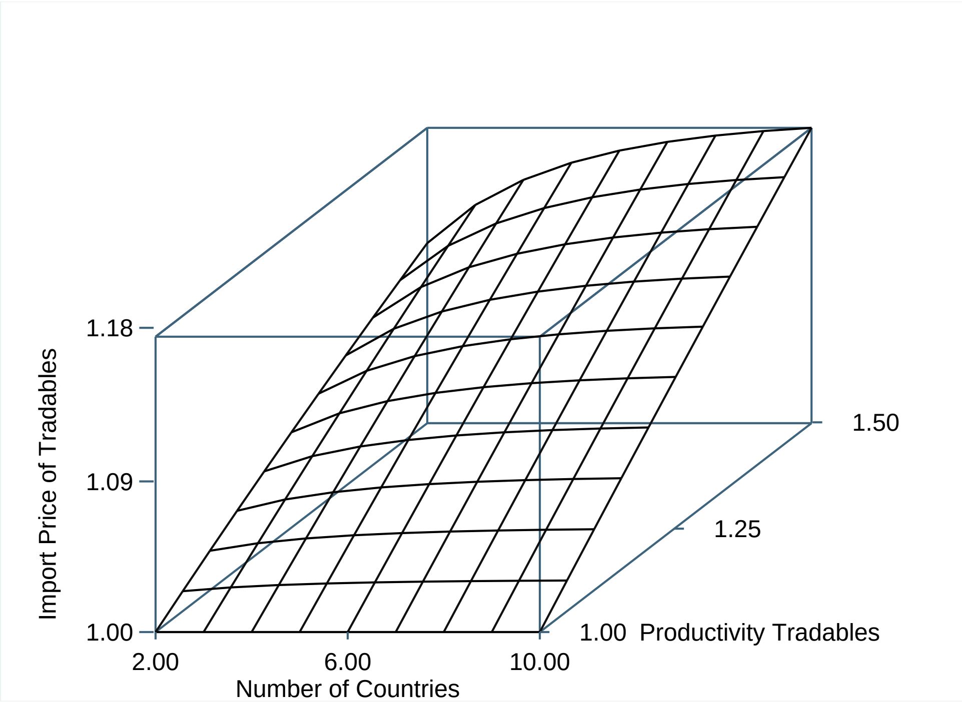

Figure 3: The price of imported tradables as a function of relative productivity of tradables and the number of countries