

Answers to Hubert Escaith

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1 Why not based on VA trade ?

Why don't we simply :

1. Compute the origin of the VA content of each good
2. Study how the price evolve following a shock on the price of VA in a country or another ?

Intuition:

That would not do because the price of, e.g. French VA does not change for everybody.

Doubt: is that enough an argument ? 2 sectors, 2 countries

1.1 Evolution of VA price

$$A = \begin{pmatrix} a_{1,1} & a_{2,1} \\ a_{1,2} & a_{2,2} \end{pmatrix}$$
$$I - A = \begin{pmatrix} 1 - a_{1,1} & -a_{2,1} \\ -a_{1,2} & 1 - a_{2,2} \end{pmatrix}$$
$$(I - A)^{-1} = \frac{1}{(1 - a_{1,1})(1 - a_{2,2}) - a_{1,2}a_{2,1}} \begin{pmatrix} 1 - a_{2,2} & a_{2,1} \\ a_{1,2} & 1 - a_{1,1} \end{pmatrix} = \begin{pmatrix} u & v \\ w & x \end{pmatrix}$$
$$\text{French demand shares} = d = \begin{pmatrix} 1 - f \\ f \end{pmatrix}$$
$$(I - A)^{-1} d = \begin{pmatrix} u - uf + vf \\ w - wf + xf \end{pmatrix}$$

Donc, en cas de choc c pour le prix de la va dans le pays étranger (en monnaie française), on peut écrire un vecteur de choc : $C = (0, c)$. les prix varient tout d'abord de CA , puis CA^2 , etc. Donc le vecteur de choc S (en monnaie française) est :

$$S = C + CA + CA^2 \dots = C(I - A)^{-1} = \begin{pmatrix} cw & cx \end{pmatrix}$$

To measure the effect on French consumption prices, we do a weighted sum of these effects.

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$$\bar{s} = c \cdot [(1-f)w + xf] = c \cdot \frac{(1-f)a_{1,2} + f(1-a_{1,1})}{(1-a_{1,1})(1-a_{2,2}) - a_{1,2}a_{2,1}} \quad (1)$$

If each nation's production only uses national inputs, we have a plausible :

$$\bar{s} = c \cdot \frac{f}{1-a_{2,2}}$$

1.2 Exchange rate shock

Using the notations in the paper...

$$\begin{aligned} \hat{C}_{\S} &= (-c, 0) \\ \mathcal{B} &= \begin{pmatrix} 0 & a_{2,1} \\ 0 & 0 \end{pmatrix} \\ \tilde{\mathcal{B}} &= \begin{pmatrix} 0 & 0 \\ a_{1,2} & 0 \end{pmatrix} \end{aligned}$$

Hence

$$\begin{aligned} S &= (0, c) + [(0, -c.a_{2,1}) + (c.a_{1,2}, 0)] * \begin{pmatrix} u & v \\ w & x \end{pmatrix} \\ &= (0, c) + (c.a_{1,2}, -c.a_{2,1}) * \begin{pmatrix} u & v \\ w & x \end{pmatrix} \\ &= (0, c) + (u.c.a_{1,2} - w.c.a_{2,1}, v.c.a_{1,2} - x.c.a_{2,1}) \\ &= (u.c.a_{1,2} - w.c.a_{2,1}, c + v.c.a_{1,2} - x.c.a_{2,1}) \end{aligned}$$

and

$$\begin{aligned} \bar{s} &= (u.c.a_{1,2} - w.c.a_{2,1}, c + v.c.a_{1,2} - x.c.a_{2,1}) \cdot \begin{pmatrix} 1-f \\ f \end{pmatrix} \\ \bar{s} &= c[f(1 + v.a_{1,2} - x.a_{2,1}) + (1-f)(u.a_{1,2} - w.a_{2,1})] \end{aligned}$$

If each nation's production only uses national inputs, we have a plausible

$$\bar{s} = c.f$$

This seems to confirm that the exchange rate shock is not the same as the VA price shock.

1.3 Residual issue

Starting from 4.2 in the paper

$$E1 = C(i.e.C^i) = (0, c)$$

$$E2 = C.\tilde{\mathcal{B}} = (0, c) \cdot \begin{pmatrix} 0 & 0 \\ a_{1,2} & 0 \end{pmatrix} = (c.a_{1,2}, 0)$$

$$E1.HC = (0, c) \cdot \begin{pmatrix} 1-f \\ f \end{pmatrix} = f.c$$

$$E2.HC = (c.a_{1,2}, 0) \cdot \begin{pmatrix} 1-f \\ f \end{pmatrix} = c.a_{1,2} \cdot (1-f)$$

$$\bar{s} - E1.HC - E2.HC =$$

$$c[f(1 + v.a_{1,2} - x.a_{2,1}) + (1-f)(u.a_{1,2} - w.a_{2,1})] - c(f + a_{1,2} \cdot (1-f))$$

$$= c[a_{1,2}((1-f)(1+u) + vf) + a_{2,1}((1-f)w - x)]$$

How can we continue to show that this thing does not depend on the openness/size of the economy? Idea : Hypothesis that

$$a_{1,2} = a_{2,1}$$

and

$$a_{1,1} = a_{2,2}$$

? And that

$$\frac{a_{1,1}}{a_{1,2}} = \frac{a_{2,2}}{a_{2,1}} = \frac{1-f}{f}$$