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 :

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

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

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$$\bar{s} = c.\left[(1-f)\,w + xf\right] = c.\frac{(1-f)\,a_{1,2} + f\,(1-a_{1,1})}{(1-a_{1,1})\,(1-a_{2,2}) - a_{1,2}a_{2,1}} \tag{1}$$

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

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

1.2 Exchange rate shock

Using the notations in the paper...

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

Hence

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

and

$$\bar{s} = \frac{c\left[(1-f)\,((1-a_{1,1})\,(1-a_{2,2}) - a_{1,2}a_{2,1}) + f\,(1 + a_{1,2}.a_{2,1} - a_{2,1}.\,(1-a_{1,1}))\right]}{(1-a_{1,1})\,(1-a_{2,2}) - a_{1,2}a_{2,1}} \bar{s} = \frac{c\left[(1-f)\,((1-a_{1,1})\,(1-\right.}{(1}$$

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

$$\bar{s} = \frac{c\left[(1-f)\,(1-a_{1,1})\,(1-a_{2,2}) + f\right]}{(1-a_{1,1})\,(1-a_{2,2})}$$