1. PARAMETERS

y0[i]	Gross output
ys0[j,i]	Sectoral supply
ty0[j]	Output tax rate
fs0[i]	Household supply
id0[i,j]	Intermediate demand
fd0[i,fd]	Final demand
va0[va,j]	Vaue added
ts0[ts,i]	Taxes and subsidies
m0[i]	Imports
x0[i]	Exports of goods and services
mrg0[i]	Trade margins
trn0[i]	Transportation costs
duty0[i]	Import duties
sbd0[i]	Subsidies on products
tax0[i]	Taxes on products
ms0[i,m]	Margin supply
md0[m,i]	Margin demand
s0[i]	Aggregate supply
d0[i]	Sales in the domestic market
a0[i]	Armington supply
bopdef	Balance of payments deficit
ta0[i]	Tax net subsidy rate on intermediate demand
tm0[i]	Import tariff
ty[j]	Output tax rate
ta[i]	Tax net subsidy rate on intermediate demand
tm[i]	Import tariff

2. VARIABLES

Y[J]	Sectoral production
A[I]	Armington supply
MS[M]	Margin supply
PA[I]	Armington price
PY[I]	Supply
PVA[VA]	Value-added
PM[M]	Margin
PFX	Foreign exchnage
RA	Representative agent

3. Macros

$CVA[j = J]$

$$\prod_{va \in VA} PVA[va]^{\theta_{va}[va,j]}$$

$PMD[i = I]$

$$\left(\theta_m[i] \cdot \left(\frac{PFX \cdot (1 + tm[i])}{(1 + tm0[i])}\right)^{1-2} + (1 - \theta_m[i]) \cdot PY[i]^{1-2}\right)^{1/(1-2)}$$

$PXD[i = I]$

$$\left(\theta_x[i] \cdot PFX^{1+2} + (1 - \theta_x[i]) \cdot \left(\frac{PA[i] \cdot (1 - ta[i])}{(1 - ta0[i])}\right)^{1+2}\right)^{1/(1+2)}$$

$MD[i = I]$

$$A[i] \cdot m0[i] \cdot \left(\frac{PMD[i] \cdot (1 + tm0[i])}{PFX \cdot (1 + tm[i])}\right)^2$$

$YD[i = I]$

$$A[i] \cdot y0[i] \cdot \left(\frac{PMD[i]}{PY[i]}\right)^2$$

$XS[i = I]$

$$A[i] \cdot x0[i] \cdot \left(\frac{PFX}{PXD[i]}\right)^2$$

$DS[i = I]$

$$A[i] \cdot a0[i] \cdot \left(\frac{PA[i] \cdot (1 - ta[i])}{(PXD[i] \cdot (1 - ta0[i]))}\right)^2$$

4. Market Clearance

$mkt\_py[i = I]$ – Market clearance for supply price

$$y0\_[i] = \sum_{j \in J} ys0\_[j, i] + fs0\_[i] - \sum_{m \in M} ms0\_[i, m]$$

$$A[i] \cdot y0[i] \cdot \left(\frac{PMD[i]}{PY[i]} \right)^2 = \sum_{j \in Y\_} Y[j] \cdot ys0[j, i] - \sum_{m \in M} MS[m] \cdot ms0[i, m]$$

$mkt\_pa[i = I]$ – Market clearance for Armington price

$$a0\_[i] = \sum_{j \in J} id0\_[i, j] + \sum_{fd \in FD} (fd0\_[i, fd])$$

$$A[i] \cdot a0[i] \cdot \left(\frac{PA[i] \cdot (1 - ta[i])}{PXD[i] \cdot (1 - ta0[i])} \right)^2 = \frac{\theta_c[i] \cdot RA}{PA[i]} + \sum_{j \in Y\_} Y[j] \cdot id0[i, j] + \sum_{xfd \in XFD} fd0[i, xfd]$$

$mkt\_pm[m\_ = M]$ – Market clearance for margin

$$\sum_{i \in I} ms0\_[i, m\_] = \sum_{i \in I} md0\_[m\_, i]$$

$$\sum_{i \in I} MS[m\_] \cdot ms0[i, m\_] = \sum_{i \in I | a0[i] \neq 0} A[i] \cdot md0[m\_, i]$$

$mkt\_pva[va]$ – Market clearance for value-added

$$\sum_{j \in J} va0[va, j] = + \sum_{j \in Y\_} Y[j] \cdot va0[va, j] \cdot \frac{CVA[j]}{PVA[va]}$$

mkt_pfx – Market clearance for foreign exchange;

$$\sum_{i \in A\_} XS[i] + bopdef = \sum_{i \in A\_} MD[i]$$

5. Zero Profit

$prf\_y[j = J]$, – Zero profit for sectoral production

$$(1 - ty0[j]) \cdot \sum_{i \in I} ys0\_[j, i] = \sum_{i \in I} id0\_[i, j] + \sum_{va \in VA} va0\_[VA, j]$$

$$(1 - ty[j]) \cdot \sum_{i \in I} PY[i] \cdot ys0[j, i] = \sum_{i \in I} PA[i] \cdot id0[i, j] + CVA[j] \cdot \sum_{va \in VA} va0[va, j]$$

$prf\_a[i = I]$, – Zero profit for Armington Supply

$$a0\_[i] \cdot (1 - ta0[[i]]) + x0\_[i] = y0\_[i] + m0\_[i] \cdot (1 + tm0[[i]]) + \sum_{m \in M} md0\_[m, i]$$

$$PXD[i] \cdot (a0[i] \cdot (1 - ta0[i]) + x0[i]) = PMD[i] \cdot (y0[i] + (1 + tm0[i]) \cdot m0[i]) + \sum_{m \in M} PM[m] \cdot md0[m, i]$$

$prf\_ms[m = M]$ – Zero profit for margin supply

$$\sum_{i \in I} PY[i] \cdot ms0[i, m] = PM[m] \cdot \sum_{i \in I} ms0[i, m]$$

6. Income Balance

bal_RA – Income balance for representative agent

$$\begin{aligned} RA = & \sum_{i \in I} PY[i] \cdot fs0[i] \\ & + PFX \cdot bopdef \\ & - \sum_{i \in I, xfd \in XFD} PA[i] \cdot fd0[i, xfd] \\ & + \sum_{va \in VA, j \in J} PVA[va] \cdot va0[va, j] \\ & + \sum_{i \in I} A[i] \cdot (a0[i] \cdot PA[i] \cdot ta[i] + PFX \cdot MD[i] \cdot tm[i]) \\ & + \sum_{j \in J} Y[j] \cdot \sum_{i \in I} (ys0[[j], [i]] \cdot PY[i]) \cdot ty[j] \end{aligned}$$

Hi Siwan!