

\$TITLE:M10-5.GMS CALIBRATION EXERCISE, FROM SHEET IO-2, M10-IOTABLE.XLS

**CALIBRATES MODEL TO SHEET IO-2 IN M10-IOTABLE.XLS*

**assumes 10% of factors are sector specific to prevent "flats" problem*

**assumes domestic and foreign goods are Armington substitutes, sigma = 5*

**assume foreign goods only used for consumption, not intermediate usage*

**aggregates household, government, and investment demand to single consumer*

SETS R rows of the IO table /1*8/
C columns of the IO table /1*11/;

SETS RS(R) subset of rows for production sectors /1*5/
CS(C) subset of columns for production sectors /1*5/;

SETS RV(R) subset of rows for value added /6*7/
CD(C) subset of columns for final demand /6*8/;

SETS I allows switching of rows and columns in sectors /1*5/;

PARAMETERS

IO(RS,I) extracts intermediate use for \$prod blocks
VA(RV,I) extracts factor requirements for \$prod blocks
TAX(I) computes implied tax rates assuming output taxes
VALUE(I) value of sector I's output at consumer prices
PRODQ(I) output quantity = value (consumer prices = 1)

PRODP(I) producer prices calculated from consumer prices (=1)+ taxes
 PRODR(I) producer revenue: $prodp * prodq$
 COST(I) cost of all inputs to the sector: should equal $prodr$
 DCONS(I) final demand (household + government + investment demand)
 FCONS(I) foreign goods demand including tariffs (domestic prices = 1)
 EX(I) exports of sector i
 TAR(I) implied tariff rates on foreign goods
 PIM(I) implied foreign prices: $1 = pim * (1 + tar)$
 TBAL trade balance: exports minus imports
 SHARE share of each factor in each sector that is sector specific;

SHARE = 0.1;

TABLE BENCH(*,*)

	1	2	3	4	5
1	19.7	24.9	76.0	19.2	13.0
2	7.9	124.9	187.5	15.9	20.3
3	19.6	29.5	311.8	129.8	63.7
4	37.4	105.3	317.1	723.2	143.0
5	12.4	8.6	18.7	57.1	264.4
6	60.3	167.2	508.8	680.1	556.7
7	75.2	50.7	175.7	821.4	202.1
8	-10.3	4.7	8.7	26.4	-15.3
+					

	6	7	8	9	10	11
1	71.2	0.0	8.4	10.5	14.7	6.0
2	39.4	0.0	23.6	153.6	55.2	2.1
3	296.5	0.0	504.0	495.5	239.7	6.4
4	1002.3	21.4	87.6	141.0	75.0	30.2
5	188.7	755.8	7.2	4.4	36.9	32.5
6	0					
7	0					
8	0					

»

;

DISPLAY BENCH;

IO(RS,I) = BENCH(RS,I);

VA(RV,I) = BENCH(RV,I);

DISPLAY IO, VA;

VALUE(I) = **SUM**(RS, BENCH(RS, I)) + **SUM**(RV, BENCH(RV, I)) + BENCH("8", I);

TAX(I) = BENCH("8", I)/VALUE(I);

DISPLAY VALUE, TAX;

PRODQ(I) = VALUE(I);

PRODP(I) = 1 - TAX(I);

PRODR(I) = PRODQ(I)*PRODP(I);

$COST(I) = \text{SUM}(RS, \text{BENCH}(RS, I)) + \text{SUM}(RV, \text{BENCH}(RV, I));$

DISPLAY PRODQ, PRODP, PRODR, COST;

$DCONS(I) = \text{SUM}(CD, \text{BENCH}(I, CD)) - \text{BENCH}(I, "10") - \text{BENCH}(I, "11");$

$FCONS(I) = \text{BENCH}(I, "10") + \text{BENCH}(I, "11");$

$EX(I) = \text{BENCH}(I, "9");$

DISPLAY DCONS, FCONS, EX;

$TAR(I) = \text{BENCH}(I, "11") / FCONS(I);$

$PIM(I) = 1 / (1 + TAR(I));$

$TBAL = \text{SUM}(I, EX(I) - (FCONS(I) * PIM(I)));$

DISPLAY TAR, PIM;

\$ONTEXT

\$MODEL: IOCAL

\$SECTORS:

$X(I)$ *!domestic production of good i*

$E(I)$ *!exports of good i*

$M(I)$ *!imports of good i*

$ARM(I)$ *!Armington aggregator of domest (X) and foreign (M) good i*

WEL *!welfare*

\$COMMODITIES:

PX(I) !*price of domestic good i*
PXF(I) !*price of foreign good i*
PFX !*price of "foreign exchange"*
PF(RV) !*price of factor rv (mobile factors)*
PFS(RV,I) !*price of specific factor rv in sector i*
PARM(I) !*price of the Armington aggregate good i*
PW !*real consumer price index*

\$CONSUMERS:

CONS !*representative consumer*

\$PROD:X(I) s:1

O:PX(I) *Q:PRODQ(I)* *P:PRODP(I)* *A:CONS* *T:TAX(I)*
I:PX(RS) *Q:IO(RS,I)* *P:1*
I:PF(RV) *Q:(VA(RV,I)*(1-SHARE))* *P:1*
I:PFS(RV,I) *Q:(VA(RV,I)*SHARE)* *P:1*

\$PROD:E(I)

O:PFX *Q:EX(I)* *P:1*
I:PX(I) *Q:EX(I)* *P:1*

\$PROD:M(I)

O:PYF(I) *Q:FCONS(I)*
I:PFX *Q:(FCONS(I)*PIM(I))* *A:CONS* *T:TAR(I)*

\$PROD:ARM(I) s:2

O:PARM(I) Q:(DCONS(I)+FCONS(I))

I:PX(I) Q:DCONS(I)

I:PIX(I) Q:FCONS(I)

\$PROD:WEL s:1

O:PW Q:(SUM(I,DCONS(I)+FCONS(I)))

I:PARM(I) Q:(DCONS(I)+FCONS(I))

\$DEMAND:CONS

D:PW Q:(SUM(I,DCONS(I)+FCONS(I)))

E:PF(RV) Q:(SUM(I,VA(RV,I))*(1-SHARE))

E:PFS(RV,I) Q:(VA(RV,I)*(SHARE))

E:PFX Q:(-TBAL)

\$OFFTEXT

\$SYSINCLUDE MPSEGET IOCAL

PW.FX = 1;

IOCAL.ITERLIM = 0;

\$INCLUDE IOCAL.GEN

SOLVE IOCAL USING MCP;

**perturbation: check that calibrated solution is indeed an equilibrium*

X.L("2") = 2;

IOCAL.ITERLIM = 5000;
\$INCLUDE IOCAL.GEN
SOLVE IOCAL USING MCP;

**counterfactual: abolish all taxes*

TAX(I) = 0;
TAR(I) = 0;

\$INCLUDE IOCAL.GEN
SOLVE IOCAL USING MCP;

PARAMETER

OUT(I);

OUT(I) = X.L(I);

DISPLAY OUT;

\$LIBINCLUDE XLDUMP OUT M10-IOTABLE.XLS SHEET4!A3