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Appendix 1　主要記号

●SAM 勘定名(左から右、上から下)

部門勘定

IND-A	工業部門
AGR-A	農業部門
CONS-A	建設部門
TRD-A	商業部門
OTM-A	その他工業部門
HOU-A	住宅管理部門
SRV-A	サービス部門

財勘定

IND-C	工業財
AGR-C	農業財
CONS-C	建設財
TRD-C	商業財
OTM-C	その他財
HOU-C	住宅管理財
SRV-C	サービス財

生産要素勘定

LAB	労働要素
CAP	資本要素

制度部門経常勘定

ENT	非金融法人企業
FENT	金融法人企業
GOV	政府
NPO	対家計サービス非営利組織(NPO)
HH	家計
STAX	間接税
PRP	財産所得
CTR	経常移転

貯蓄投資勘定

CAPCON	固定資本減耗
S-ENT	非金融法人貯蓄
S-FENT	金融法人貯蓄
S-GOV	政府貯蓄
S-NPO	NPO 貯蓄
S-HH	家計貯蓄
CAPTR	資本移転
INVINT	在庫投資
INVFIX	固定資本投資
FIN	貯蓄投資差額(金融投資)

外国部門

ROW	外国

●モデル(アルファベット順)

勘定集合名

A	部門集合(**-A)
C	財集合(**-C)
F	生産要素集合(LAB, CAP)
H	家計集合(ウズベク SISC モデルでは家計 HH のみがメンバー)
I	ROWを含む制度部門(ENT, FENT, GOV, NPO, ROW)
ID	国内制度部門(ENT, FENT, GOV, NPO)
SD	国内制度部門貯蓄勘定 S-ENT, S-FENT, S-GOV, S-NPO)

変数

CTRGOVR	政府経常移転受取額
CTRPAY(ID)	国内制度部門別経常移転支払額
E(ID)	国内制度部門経常支出
EG	政府部門経常支出
EXR	為替レート(邦貨/外貨)
FFISIM(A)	部門別 FISIM 投入額
FINBL(SD)	制度部門別貯蓄投資差額
FSAV	邦貨建外国貯蓄
IADJ	固定資本投資調整係数
MPS(H)	家計貯蓄率
NINVFIX	名目固定資本投資額
NINVINT	名目在庫投資額
NKCONS(A)	部門別名目固定資本減耗額
NS(SD)	制度部門別純貯蓄
PA(A)	部門生産者価格
PD(C)	国内財購入者価格
PE(C)	邦貨建輸出財価格
PM(C)	邦貨建輸入財価格
PQ(C)	アブソープション財価格
PVA(A)	部門付加価値価格
PX(C)	財生産者価格
QA(A)	部門生産量
QD(C)	国内財国内販売量
QE(C)	財輸出量

QF(F,A)	部門別生産要素需要量
QFS(F)	生産要素供給量
QH(C,H)	財別家計最終消費量
QINT(C,A)	生産部門別中間財投入量
QINVBYI(SD)	制度部門別固定資本投資量
QINVFIX(C)	固定資本投資用財需要量
QM(C)	輸入財量
QQ(C)	財別アブソープション量
QQVA(A)	部門純付加価値
QX(C)	国内財生産量
TFISIM	FISIM 総額
WALRAS	ダミー変数(均衡状態でゼロ)
WF(F)	生産要素価格
WFDIST(F,A)	部門別生産要素価格
Y(ID)	制度部門別経常収入
YF(I,F)	制度部門別要素所得(分配)
YG	政府部門経常収入
YH(H)	家計部門経常収入

パラメータ

(*は SAM 以外のデータから値を得る)

ad(A)	CD 型関生産関数スケール
alpha(F,A)	部門別要素別付加価値シェア
aq(C)	アーミントン関数スケール
at(C)	CET 関数スケール
beta(C,H)	家計最終消費財別シェア
capconr(SD)	固定資本減耗の制度部門比重
captrpay(S)	制度部門別資本移転支払額
captrrec(S)	制度部門資本移転受取額
cpi	消費者物価指数
ctrpayr(ID)	経常移転支払/国内制度部門経常収入比
ctrrec(IWG)	国内制度部門(政府を除く)別経常移転受取額
ctrrowp	外貨建外国部門経常移転支払額
cwts(C)	CPI 算出用財別ウェイト
deltaq(C)	アーミントン関数シェア
deltat(C)	CET 関数シェア
finvbyir(SD)	固定資本投資制度部門比重
fisimr(A)	FISIM/部門産出量比
ica(C,A)	部門投入係数
intbyir(SD)	在庫投資需要制度部門比重
othsitem(SD)	外国部門からの貴重品購入額(投資支出項目)
prppay(I)	制度部門財産所得支払額
prprec(I)	制度部門財産所得受取額
pwe(C)	外貨建輸出財価格
pwm(C)	外貨建輸入財価格
qg(C,IIHF)	国内制度部門別(家計、金融法人除く)財別最終需要量
qinvbar(C)	基準均衡点固定資本投資財需要量
qinvint(C)	基準均衡点在庫投資財需要量
qkconsr(A)	部門別固定資本資本減耗/資本要素投入量比
rhoq(C)	アーミントン関数弾力性パラメータ*
rhot(C)	CET 関数弾力性パラメータ*
shry(I,F)	生産要素別要素所得制度部門シェア
te(C)	財別輸出補助金率
theta(A,C)	部門産出量中財ウェイト
tm(C)	財別関税率
tq(C)	財別間接税率
ty(ID)	国内制度部門別直接税率
vaica(A)	付加価値/部門産出量比

Appendix 2　GAMS コード(コア部分のみ)

(注)　<<SKIP>>は省略した部分.
　　*行、小文字部分は説明文.

```
*////// SETS //////
SETS
AC global set (SAM accounts and other items)
                /
*factors
LAB             labor
CAP             capital

*institutional accounts including transfer
                accounts
ENT             non-financial corporation
FENT            financial corporation
GOV             government
NPO             non-profit organizations serving
                for households
HH              households inc. unincorporated
                businesses
TAR             import tariff    (All zero in this
                model)
YTAX            direct taxes    (substituted for CTR
                in this model)
STAX            indirect taxes
PRP             property income
CTR             current transfer

*savings accounts for institutions
CAPCON          consumption of fixed capital
S-ENT
S-FENT
S-GOV
S-NPO
S-HH
CAPTR           capital transfer
INVINT          inventory investments (fixed in this
                model)
INVFIX          fixed investment
FIN             S-I balance

* Production activity accounts (generation of
                value added)
IND-A           industry
AGR-A           agriculture
CONS-A          construction
TRD-A           trade transport communication
OTM-A           other manufacturing
HOU-A           housing
SRV-A           services

* Commodities
IND-C           industry
AGR-C           agriculture
CONS-C          construction
TRD-C           trade transport communication
OTM-C           other manufacturing
HOU-C           housing
SRV-C           services

* Rest of world
ROW             rest of world
TOTAL           total account in SAM        /

*ACNT for SAM total cells
ACNT(AC)        all elements in AC except total
A(AC)           activities
        / IND-A, AGR-A, CONS-A, TRD-A,
                OTM-A, HOU-A, SRV-A /
C(AC)           commodities
        / IND-C, AGR-C, CONS-C, TRD-C,
                OTM-C, HOU-C, SRV-C /
CE(C)           exported commodities
        /IND-C, AGR-C, CONS-C, TRD-C,
                OTM-C, SRV-C/
CNE(C)          non-exported commodities
        / HOU-C /
CM(C)           imported commodities
        /IND-C,AGR-C,CONS-C,TRD-C,OTM-
                C,HOU-C,SRV-C/
CWS(C)          commodity excluding srv-c for
                fisim calc
        /IND-C,AGR-C, CONS-C, TRD-C,
                OTM-C, HOU-C /
F(AC)           factors         / LAB, CAP /
GP(AC)          government and npo
        / GOV, NPO /
I(AC)           institutions
        / ENT, FENT, GOV, NPO, HH, ROW /
ID(I)   domestic institutions
        / ENT, FENT, GOV, NPO, HH/
IIH(ID)         inst. exc. hh row
        /ENT,FENT,GOV,NPO/
IWG(I)          inst. exc. gov
        /ENT, FENT, NPO, HH, ROW /
IIHF(IIH)       inst. exc. HH ROW FENT
        / ENT, GOV, NPO /
H(ID)           households              / HH /
S(AC)           saving accounts of institutions
```

```
        / S-ENT, S-FENT, S-GOV, S-NPO,
          S-HH, ROW /
SD(S)     domestic saving accounts
        / S-ENT, S-FENT, S-GOV, S-NPO,
          S-HH /     ;

ALIAS(AC,ACP); ALIAS(C,CP);
          ALIAS(F,FP); ALIAS(I,IP);
ALIAS(SD,SDP);
ACNT(AC)=YES; ACNT('TOTAL')=NO;
ALIAS(ACNT,ACNTP);

*////// PARAMETERS //////
PARAMETERS
ad(A)          efficiency parameter in the
               production fn for a
alpha(F,A)     share of value-added to factor f in
               activity a
aq(C)          Armington function shift
               parameter for commodity c
at(C)          CET function shift parameter for
               commodity c
beta(C,H)      share of hh. cons. spend. on
               commodity c
cpi            consumer price index
cwts(C)        weight of commodity c in the CPI
deltaq(C)      Armington func. parameter for
               commodity c
deltat(C)      CET function share parameter for
               commodity c
ica(C,A)       qt. of c as intermediate input per
               unit of act. a
pwe(C)         export price for c (foreign
               currency)
pwm(C)         import price for c (foreign
               currency)
qg(C,IIHF)     IIHF(Institutions exc. HH & FENT
               demand for c
qinvbar(C)     base-year qnty of invest. dem. for
               commodity c
qinvint(C)     qnty of inventory investment for
               commodity c
rhoq(C)        Armington function exponent for
               commodity c
rhot(C)         CET function exponent for
               commodity c
shry(I,F)      share for household h in the
               income of factor f
te(C)          export subsidy rate for commodity
               c
theta(A,C)     yield of output c per unit of
               activity a (all 1 )
tm(C)          imp. tariff rate for com. c (0 for
               this model)
tq(C)          rate of sales tax for commodity c
ty(ID)         rate of income tax for HH (0 for
               this model)
vaica(A)       value added to activity level ratio
qkconsr(A)     fixed capital consumption rate per
               QF(CAP A)
fisimr(A)      fisim per QA(A)
intbyir(SD)    inventory investment share of
               institutions
finvbyir(SD)   fixed investment share of
               institutions
ctrpayr(ID)    curr transfer payable ratio to
               income
ctrrowp        curr tran. payable of ROW in dom.
               curr.(FIX)
ctrrec(IWG)    curr tran. receivable of Inst. exc.
               GOV (FIX)
prprec(I)      property income receivable fixed
prppay(I)      property income payable fixed
captrrec(S)    capital transfer receivable fixed
captrpay(S)    capital transfer payable fixed
capconr(SD)    share of each inst. in total cap.
               cons.
othsitem(SD)   sav-Inv foreign finance item
               (fixed)          ;

*////// VARIABLES //////
VARIABLES
E(ID)          expenditures of institutions
EXR            exchange rate (dom. curr. per unit
               of for. curr.)
FSAV           foreign saving (dom. curr. )
IADJ           investment adjustment factor
MPS(H)         marginal (& avg.) propensity to
               save for hh.
PA(A)          price of activity a
PD(C)          domestic price of domestic output
               c
PE(C)          export price for c (domestic
               currency)
PM(C)           import price for c (domestic
               currency)
PQ(C)          composite commodity price for c
PVA(A)         value-added price for activity a
PX(C)          producer price for commodity c
QA(A)           level of activity a
QQVA(A)        net value added exc. fisim indtax
               capcon
QD(C)           quantity sold domestically of
               domestic output c
QE(C)          quantity of exports for commodity
               c
QF(F,A)        quantity demanded of factor f from
               activity a
```

```
QFS(F)        supply of factor f
QH(C,H)       qnty. consumed of com. c by
              household h
QINT(C,A)     qnty of com. c as intermediate
              input to act. a
QINVFIX(C)qnty of investment demand for
              commodity c
QM(C)         qnty of imports of commodity c
QQ(C)         qnty of absorption
QX(C)         qnty of domestic output of
              commodity c
WALRAS        dummy variable (zero at
              equilibrium)
WF(F)         average] price of factor f
WFDIST(F,A)   wage distortion factor for
              factor f in activity a
YF(I,F)       transfer of income to household h
              from factor f
Y(ID)         revenue of institutions
YH(H)         income of household
EG            government expenditure for
              convertibility
YG            government revenue for
              convertibility
FFISIM(A)     FISIM for each activity all fixed
TFISIM        FENT pay the amount of fisim to
              buy SRV-C
NKCONS(A)     Nominal capital consumption
              for activity
CTRPAY(ID)    curr trans. payable (fixed
              ratio)
CTRGOVR       curr transfer receivable of GOV
              (residual)
QINVBYI(SD)   fixed investment by institution
              (quantity term)
NINVINT       total nominal inventory investment
NINVFIX       total nominal fixed investment
NS(SD)        net saving
FINBL(SD)     net lending                    ;

*////// EQUATIONS //////
EQUATIONS

*>>>> declaration <<<<

*==== Price Block ====
PMDEF(C)      import price for commodity c
              (dom. curr.)
PEDEFF(C)     export price for commodity c
              (dom. curr.)
ABSORB(C)     absorption for commodity c
OUTVAL(C)     output value for commodity c
PADEF(A)      price for activity a
PVADEF(A)     value-added price for activity

*==== Production and Commodity Block ====
PRODFN(A)     Cobb-Douglas
FACDEM(F,A)   demand for factor f from
              activity a
INTDEM(C,A)   intermed. Dem. for com. c
              from activity a
OUTPUTFN(C)   output of commodity c
NKCONSF(A)    fixed capita consumption
FFISIMF(A)    calcu. of fisim by activity
TFISIMF       summation of FFISIM(A)
ARMING(C)     composite supply (Arm. func.
              for com. c)
IMPDOMRAT(C)  imp.-dom. demand
              ratio for commodity c
CET(C)        output transform. func. for
              commodity c
EXPDOMRAT(C)  exp.-dom. supply
              ratio for commodity c
CETNE(C)      output for non-exported
              commodity c
COMEQA(CWS)   market equilib.
              condition for c
COMEQB        for SRV-C because of FISIM
NOEX(C)       fill QE with 0 for Non-export sec

*==== Institution Block ====
FACTTRANS(I,F)  transfer of income
              from factor f to HH
FACTEQ(F)     market equilibrium condition
              for factor f
HHDINC(H)     income of household h
HHDEM(C,H)    cons. dem. for HH and
              commodity c
HHEXP(H)      households expenditures
INVDEM(C)     investment demand for
              commodity c
ENTREV        corporation revenue
ENTEXP        corporation expenditures
FENTREV       financial corporation revenue
FENTEXP       financial corporation expenditures
NPOREV        NPO revenue
NPOEXP        NPO expenditures
GOVREV        government revenue
GOVEXP        government expenditures
CTROUT(ID)    current transfer from
              institution
CTRGOVRF      define current transfer
              receivable of GOV

*==== Domestic Institutions Investment
              Saving Block ====
NINVINTF      total nominal inventory
              investment
```

```
NINVFIXF        total nominal fixed investment
NSAVENT         net saving of ENT
NSAVFENT        net saving of FENT
NSAVGOV         net saving of GOV
NSAVNPO         net saving of NPO
NSAVHH          net saving of HH
SAVINV(SD)      saving-investment balance
FIN             financial investment balancing

*==== System Constraint Block ====
BOP             Balance of Payments
PNORM           price normalization
                ;

*>>>> description of equations <<<<

*==== Price Block ====
PMDEF(C)$CM(C)..
   PM(C) =E= (1 + tm(C))*EXR*pwm(C);
PEDEFF(C)$CE(C)..
   PE(C) =E= (1 - te(C))*EXR*pwe(C);
ABSORB(C)..PQ(C)*QQ(C) =E=
        (PD(C)*QD(C)+(PM(C)*QM(C))$CM(
              C))*(1 + tq(C));
OUTVAL(C)..
   PX(C)*QX(C)+(PM(C)*QM(C))$CM(C)+
              (PD(C)*QD(C)+
              (PM(C)*QM(C))$CM(C))*tq(C)
        =E=
       PQ(C)*QQ(C) + (PE(C)*QE(C))$CE(C);
PADEF(A)..
   PA(A) =E=SUM(C,PX(C)*theta(A,C));
PVADEF(A)..
   PVA(A) =E=
   PA(A) -SUM(C, PQ(C)*ica(C,A))
        -WF('CAP')*WFDIST('CAP',A)*qkcons
              r(A)*QF('CAP',A)/QA(A)
              -PQ('SRV-C')*fisimr(A);

*==== Activity and Commodity Block ====
OUTPUTFN(C)..
   QX(C) =E= SUM(A, theta(A,C)*QA(A));
PRODFN(A)..
   QA(A) =E= ad(A)*PROD(F,
              QF(F,A)**alpha(F,A));
INTDEM(C,A)..
   ica(C,A)*QA(A) =E= QINT(C,A);
NKCONSF(A)..    NKCONS(A) =E=
              QF('CAP',A)*qkconsr(A)*WF('CA
              P')*WFDIST('CAP',A);
 FFISIMF(A)..
              fisimr(A)*QA(A)*PQ('SRV-C')
              =E= FFISIM(A);
 TFISIMF..
   TFISIM =E= SUM(A, FFISIM(A));
FACDEM(F,A)..
   WF(F)*WFDIST(F,A) =E=
        alpha(F,A)*PVA(A)*QA(A)/QF(F,A);
ARMING(C)$CM(C)..
   QQ(C) =E= aq(C)*
        ( deltaq(C)*QM(C)**(-rhoq(C))
        +(1-deltaq(C))*QD(C)**(-rhoq(C)) )**
        (-1/rhoq(C));
IMPDOMRAT(C)$CM(C)..
   QM(C)/QD(C) =E= (PD(C)/PM(C)) *
              (deltaq(C)/(1-deltaq(C)) )**(1/(1 +
              rhoq(C)));
CET(C)$CE(C)..
   QX(C) =E=
              at(C)*(deltat(C)*QE(C)**rhot(C)
              +(1-deltat(C)) *QD(C)**rhot(C) )
              ** (1/rhot(C));
EXPDOMRAT(C)$CE(C)..
   QE(C)/QD(C) =E=
        ( PE(C)/PD(C)*(1-deltat(C))/deltat(C) )
              ** (1/(rhot(C)-1));
CETNE(C)$CNE(C)..     QX(C) =E= QD(C);
NOEX(C)$CNE(C)..      QE(C) =E= 0;
OMEQA(CWS)..
        QQ(CWS) =E=SUM(A,QINT(CWS,A))
        +SUM(H,QH(CWS,H))
        +SUM(IIHF,qg(CWS,IIHF))
        +QINVFIX(CWS)+qinvint(CWS);
COMEQB..    QQ('SRV-C') =E=
        SUM(A, QINT('SRV-C',A))
        +SUM(H, QH('SRV-C',H))
        +SUM(IIHF, qg('SRV-C', IIHF))
        +TFISIM/PQ('SRV-C')
        +QINVFIX('SRV-C')
        +qinvint('SRV-C');

*==== Institution Block ====
FACTEQ(F)..
   SUM(A, QF(F,A)) =E= QFS(F);
FACTTRANS(I,F)..
   YF(I,F) =E=shry(I,F)* SUM(A,
              WF(F)*WFDIST(F,A)*QF(F,A));
HHDINC('HH')..
   Y('HH') =E= SUM(F, YF('HH',F)) +
              prprec('HH') + ctrrec('HH');
HHDEM(C,H)..
   QH(C,H) =E= beta(C,H) * (1-MPS(H))*
        ((1-ty(H))*(Y(H)-CTRPAY(H)-
              prppay(H))) / PQ(C);
HHEXP(H)..
   E(H) =E= SUM(C,QH(C,H)*PQ(C)) +
              prppay(H)
        + CTRPAY(H) +ty(H)*Y(H);
```

```
GOVREV..
   Y('GOV') =E= SUM(F, YF('GOV',F)) +
                SUM(ID,ty(ID)*Y(ID))+prprec('G
                OV')+CTRGOVR
        + SUM(C,
                tq(C)*(PD(C)*QD(C)+(PM(C)*Q
                M(C))$CM(C)))
        + SUM(C$CM(C),
                tm(C)*EXR*pwm(C)*QM(C))
        + SUM(C$CE(C),
                te(C)*EXR*pwe(C)*QE(C));
GOVEXP..
   E('GOV') =E= SUM(C, PQ(C)*qg(C,'GOV'))
                +prppay('GOV')
                + CTRPAY('GOV');
ENTREV..
   Y('ENT') =E= SUM(F, YF('ENT',F)) +
                prprec('ENT')+ ctrrec('ENT');
ENTEXP..
   E('ENT') =E= prppay('ENT') +
                CTRPAY('ENT') +
                ty('ENT')*Y('ENT');
FENTREV..    Y('FENT') =E=
         SUM(F, YF('FENT',F)) +
                prprec('FENT')
         + ctrrec('FENT') + TFISIM;
FENTEXP..
   E('FENT') =E=
         prppay('FENT')+CTRPAY('FENT')
         + ty('FENT')*Y('FENT')    + TFISIM;
NPOREV..
   Y('NPO') =E= SUM(F, YF('NPO',F)) +
                prprec('NPO')+ ctrrec('NPO');
NPOEXP..
   E('NPO') =E= SUM(C, PQ(C)*qg(C,'NPO'))
                + prppay('NPO')+
                CTRPAY('NPO') +
                ty('NPO')*Y('NPO');
CTROUT(ID)..
   CTRPAY(ID) =E= ctrpayr(ID)*Y(ID);
CTRGOVRF..
   CTRGOVR =E=SUM(ID,CTRPAY(ID))
        +ctrrowp -SUM(IWG, ctrrec(IWG));

*== Domestic Saving-Investment Accounts ==
NSAVENT..
        NS('S-ENT') =E= Y('ENT')-E('ENT');
NSAVFENT..
      NS('S-FENT') =E= Y('FENT')-E('FENT');
NSAVGOV..
        NS('S-GOV') =E= Y('GOV')-E('GOV');
NSAVNPO..
        NS('S-NPO') =E= Y('NPO')-E('NPO');
NSAVHH..  NS('S-HH') =E= Y('HH')-E('HH');

NINVINTF..
  NINVINT =E= SUM(C, qinvint(C)*PQ(C));
INVDEM(C)..
        QINVFIX(C) =E= qinvbar(C)*IADJ;
NINVFIXF..
        NINVFIX =E=
        SUM(C, QINVFIX(C)*PQ(C));
SAVINV(SD)..
        FINBL(SD) =E=
        NS(SD) + capconr(SD)*SUM(A,
                NKCONS(A))
        + captrrec(SD) -
                finvbyir(SD)*NINVFIX
        - intbyir(SD)*NINVINT - captrpay(SD)
                - othsitem(SD);
FIN..
        SUM(SD,FINBL(SD))+ FSAV =E= 0;

*==== Balance of Payments =====
BOP.. SUM(C$CM(C), pwm(C)*QM(C)) +
                ctrrec('ROW')/EXR
        + prprec('ROW')/EXR +
                captrrec('ROW')/EXR
        + SUM(SD,othsitem(SD)/EXR)
           =E=
        SUM(C$CE(C),
                pwe(C)*QE(C))+prppay('ROW')/E
                XR
        +captrpay('ROW')/EXR+FSAV/EXR +
                WALRAS;

*==== Price normalisation ====
  PNORM..  SUM(C, PQ(C)*cwts(C)) =E= cpi;

*////// MODEL //////
MODEL CGE5 Open-economy model /ALL/;
CGE5.ITERLIM=10000;

*////// Social Accounting Matrix //////
TABLE SAM(AC,ACP) social accounting
                matrix
<<SKIP>>

*////// Assignments for Parameters and
                Variables //////
*////// Or Calibration //////
PARAMETERS
*>>>> declaration <<<<

*The following parameters are used
*to define initial value of model variables.
E0(ID), EG0, EXR0, FSAV0, IADJ0,
MPS0(H), PA0(A),PD0(C),
PE0(C), PM0(C), PQ0(C), PVA0(A), PX0(C),
```

```
QA0(A), QD0(C),QE0(C), QF0(F,A), QFS0(F),
QH0(C,H), QINT0(C,A),INVFIX0(C),
QM0(C), NKCONS0(A), NINVINT0,
NINVFIX0,QQ0(C), QX0(C), WF0(F),
WFDIST0(F,A), FFISIM0(A),TFISIM0,
YF0(I,F), Y0(ID), YH0(H), YG0,
CTRREC0(ID), CTRPAY0(ID),
NS0(SD),FINBL0(SD), CTRGOVR0,
WALRAS0 ;

*>>>> description of parameters <<
*== Factor Employment and Factor Prices ==
PARAMETERS
labor(A)      quantity of labor employed by
              activity
wfa(F,A)      wage for factor f in act. a ( for
              calibration)
costgap(F,A) for checking           ;

* Factor employment and supply *
labor(A)          = SAM('LAB',A);
QF0('LAB',A)      = labor(A);
QF0('CAP',A)      = SAM('CAP',A);
QFS0(F)           = SUM(A, QF0(F,A));

* computing activity-specific wage *
wfa(F,A)      = SAM(F,A) / QF0(F,A);
*computing average wage *
WF0(F)= SUM(A, SAM(F,A)) / SUM(A,
              QF0(F,A));
* computing wage distortion factors *
WFDIST0(F,A)  = wfa(F,A) / WF0(F);
*checking calibration *
        costgap(F,A) = WF0(F)*
WFDIST0(F,A)*QF0(F,A) - SAM(F,A);

*=====Price Block =====
PARAMETERS
sigmaq(C)   elasticity of subst. bt. dom goods
              and imports for c
sigmat(C)   elasticity of transf. bt. dom sales
              and exports for c ;

EXR0          = 1;
PA0(A)        = 1;
PD0(C)        = 1;
PE0(C)        = 1;
PM0(C)        = 1;
PX0(C)        = 1;
PVA0(A)       = SUM(F,SAM(F,A)) /
              (SAM(A,'TOTAL')/PA0(A));
tq(C)  = SAM('STAX',C) / (SAM('TAR',C)+
        SAM('ROW',C)+SUM(A,SAM(A,C))
        -SAM(C,'ROW'));
PQ0(C)        = 1 + tq(C);
QA0(A)        = SAM('TOTAL', A) /PA0(A);
QD0(C)        = (SUM(A,SAM(A,C))-
              SAM(C,'ROW'))/PD0(C);
QE0(C)        = SAM(C,'ROW') / PE0(C);
QM0(C)        = (SAM('ROW',C) +
              SAM('TAR',C)) / PM0(C);
QQ0(C)        = (SAM('TOTAL',C) -
              SAM(C,'ROW'))/PQ0(C);
QX0(C)        = SUM(A, SAM(A,C)) / PX0(C);
ica(C,A)      = (SAM(C,A) / PQ0(C)) / QA0(A);
theta(A,C)    = (SAM(A,C) / PX0(C)) / QA0(A);
vaica(A)      = (SAM('LAB',A)+
        SAM('CAP',A))/SAM('TOTAL',A);
te(C)         = 0;
pwe(C)        = PE0(C) / (1 +te(C)*EXR0);
tm(C)$CM(C)    = SAM('TAR',C) / SAM
              ('ROW',C);
pwm(C)$CM(C)= PM0(C) / ( EXR0 *
              (1+tm(C)) );

*===Production and Commodity Block ===
QINT0(C,A) = SAM(C,A)/PQ0(C);
alpha(F,A)= AM(F,A)/SUM(FP, SAM(FP,A));
ad(A)= QA0(A) / PROD(F,
              QF0(F,A)**alpha(F,A));
sigmat(C)    = 2.0;
sigmaq(C)    = 0.7;
rhot(C)       = 1/sigmat(C) + 1;
rhoq(C)       = 1/sigmaq(C) - 1;
deltat(C)$CE(C) = 1 / ( 1+(PD0(C)/PE0(C))*
              (QE0(C)/QD0(C))**(rhot(C)-1) );
at(C)$CE(C) = QX0(C)
              /(( deltat(C)*QE0(C)**rhot(C)
                +
              (1-deltat(C))*QD0(C)**rhot(C) )
              ** ( 1/rhot(C)));
deltaq(C)$CM(C) = 1 / (1 + (PD0(C)/PM0(C))*
        (QD0(C)/QM0(C)) ** (1+rhoq(C)) );
aq(C)$CM(C)    = QQ0(C) /
        ((deltaq(C)*QM0(C)**(-rhoq(C))
        +(1-deltaq(C))*QD0(C)**(-rhoq(C)))**
        (-1/rhoq(C)));
fisimr(A)     =(SAM('FENT',A)
              /PQ0('SRV-C'))/QA0(A);
FFISIM0(A) = SAM('FENT',A);
TFISIM0     = SAM('SRV-C','FENT');
qkconsr(A)=SAM('CAPCON',A)/
              SAM('CAP',A);
capconr(SD) =SAM(SD,'CAPCON') /
              SAM('TOTAL','CAPCON');
NKCONS0(A)   = SAM('CAPCON',A);

*=====Institution Block ======
```

```
EG0          =
             SAM('TOTAL','GOV')-SAM('S-G
             OV','GOV');
QH0(C,H)   = SAM(C,H) / PQ0(C);
YF0(I,F)     = SAM(I,F);
YG0          = SAM('GOV','TOTAL');
YH0(H)       = SAM('TOTAL',H);
E0('ENT')    = SAM('TOTAL','ENT')
             -SAM('S-ENT','ENT');
E0('FENT')  =SAM('TOTAL','FENT')
             -SAM('S-FENT','FENT');
E0('GOV')    = EG0;
E0('NPO')    = SAM('TOTAL','NPO')
             -SAM('S-NPO','NPO');
E0('HH')     =SAM('TOTAL','HH')
             -SAM('S-HH','HH');
Y0('ENT')    = SAM('TOTAL','ENT');
Y0('FENT') = SAM('TOTAL','FENT');
Y0('GOV')  = YG0;
Y0('NPO')    = SAM('TOTAL','NPO');
Y0('HH')     = SAM('TOTAL','HH');
beta(C,H)    = SAM(C,H) / SUM(CP,
             SAM(CP,H));
qg(C,IIHF)  = SAM(C,IIHF) / PQ0(C);
shry(I,F)    = SAM(I,F) / SAM('TOTAL', F);
ty(ID)       = SAM('YTAX',ID) /
             SAM('TOTAL',ID);
MPS0(H)    = SAM('S-HH',H)/
         (SAM(H,'TOTAL')-SAM('PRP',H)
         -SAM('YTAX',H)-SAM('CTR',H));
ctrrec(IWG)  = SAM(IWG,'CTR');
ctrrowp        = SAM('CTR','ROW');
CTRGOVR0     = SAM('GOV','CTR');
CTRREC0(ID)  = SAM(ID,'CTR');
ctrpayr(ID)      = SAM('CTR',ID) / Y0(ID);
CTRPAY0(ID)  = ctrpayr(ID)*Y0(ID);
prprec(I)        = SAM(I,'PRP');
prppay(I)        = SAM('PRP',I);

*==== Investment-Saving =====
captrrec(S)  = SAM(S,'CAPTR');
captrpay(S)  = SAM('CAPTR',S);
qinvint(C)   = SAM(C, 'INVINT') / PQ0(C);
intbyir(SD)  = SAM('INVINT',SD)/
             SAM('INVINT','TOTAL');
NINVINT0  = SAM('TOTAL','INVINT');
IADJ0        = 1;
qinvbar(C)   = SAM(C, 'INVFIX') / PQ0(C);
finvbyir(SD)=SAM('INVFIX',SD)/
             SAM('INVFIX','TOTAL');
QINVFIX0(C)= SAM(C, 'INVFIX') / PQ0(C);
NINVFIX0  = SAM('INVFIX','TOTAL');
NS0('S-ENT')     = SAM('S-ENT','ENT');
NS0('S-FENT')   = SAM('S-FENT','FENT');
NS0('S-GOV')    = SAM('S-GOV','GOV');
NS0('S-NPO')    = SAM('S-NPO','NPO');
NS0('S-HH')      = SAM('S-HH','HH');
othsitem(SD)= SAM('ROW', SD)
               - SAM(SD, 'ROW');
FINBL0(SD)= SAM('FIN',SD);
FSAV0        = SAM('FIN','ROW');

*= system constraints and price normalisation =
WALRAS0   = 0;
cwts(C)        = SUM(H, SAM(C,H)) /
             SUM((CP,H), SAM(CP,H));
cpi              = SUM(C,cwts(C)*PQ0(C));

*////// Initialisation //////   <<SKIP>>

*////// Selecting Closures //////
*== Saving - Investment Balance Closure ==
SCALAR
SICLOS      saving-investment closure /1/
* select    1 or 2
* if SICLOS = 1, saving is investment driven
* if SICLOS = 2, investment is saving-driven;

IF (SICLOS EQ 1,
* Investment-driven saving: MPS flexible,
* permitting the saving value to adjust.
IADJ.FX      = IADJ0;
MPS.LO('HH')   = -INF;
MPS.UP('HH')   = +INF;
MPS.L('HH')      = MPS0('HH');      );

IF (SICLOS EQ 2,
* Saving-driven investment:IADJ flexible
* investment quantities and value to adjust.
MPS.FX(H)  = MPS0(H);
IADJ.LO      = -INF;
IADJ.UP      = +INF;
IADJ.L         = IADJ0;      );

*==== Factor Market Closure ====
* For each factor, fix (A + 1) quantity and/or
   price variables

SCALARS
CAPCLOS        closure for capital market /2/
*select 1 or 2
* if 1, capital is mobile and fully employed
* if 2, cap is act.-specific and fully employed

  LABCLOS       closure for labor market /1/
*select 1 or 2
* if 1, labor is mobile and fully employed
* if 2, labor is mobile & unemp. (fixed wages);
```

```
IF (CAPCLOS EQ 1,
*Capital is fully emp. & mobile.
*WF('CAP') is the market-clear variable
*for the unified capital market.
WFDIST.FX('CAP',A)=WFDIST0('CAP',A);
WF.LO('CAP')   = -INF;
WF.UP('CAP')   = +INF;
WF.L('CAP')    = WF0('CAP');
QF.LO('CAP',A)= -INF;
QF.UP('CAP',A)= +INF;
QF.L('CAP',A)  = QF0('CAP',A);
QFS.FX('CAP')  = QFS0('CAP'); );

IF (CAPCLOS EQ 2,
*Capital is fully employed and activity-specific.
*WFDIST('CAP',A) is the market-clearing var.
* one for each segment of the capital market.
WFDIST.LO('CAP',A)   = -INF;
WFDIST.UP('CAP',A)   = +INF;
WFDIST.L('CAP',A)= WFDIST0('CAP',A);
WF.FX('CAP')         = WF0('CAP');
QF.FX('CAP',A)       = QF0('CAP',A);
QFS.FX('CAP')        = QFS0('CAP'); );

IF (LABCLOS EQ 1,
*Labor is fully employed and mobile.
* WF('LAB') is the m.-c. varia. for the unified
* capital market.
WFDIST.FX('LAB',A)= WFDIST0('LAB',A);
WF.LO('LAB')   = -INF;
WF.UP('LAB')   = +INF;
WF.L('LAB')    = WF0('LAB');
QF.LO('LAB',A)= -INF;
QF.UP('LAB',A)= +INF;
QF.L('LAB',A)  = QF0('LAB',A);
QFS.FX('LAB')  = QFS0('LAB');    );

IF (LABCLOS EQ 2,
*Labor is unemp. & mobile. For each activity,
*WFDIST('LAB',A)*WF('LAB') is
*fixed.QFS('LAB') is the market-clearing
*variable for the unified labor market.
WFDIST.FX('LAB',A) = WFDIST0('LAB',A);
WF.FX('LAB')    = WF0('LAB');
QF.LO('LAB',A)= -INF;
QF.UP('LAB',A)= +INF;
QF.L('LAB',A)  = QF0('LAB',A);
QFS.LO('LAB')  = -INF;
QFS.UP('LAB')  = +INF;
QFS.L('LAB')   = QFS0('LAB');    );

*===== Foreign Exchange Market ======
SCALAR
ROWCLOS       rest-of-world closure /2/
*Select 1 or 2
*if ROWCLOS = 1, exchange rate is flexible
*if 2, foreign savings is flexible    ;

IF (ROWCLOS EQ 1,
* For. sav. fixed. A flexible exr. clears
* the current a/c of the balance of payments.
FSAV.FX   = FSAV0;
EXR.LO    = -INF;
EXR.UP    = +INF;
EXR.L      = EXR0;    );

IF (ROWCLOS EQ 2,
* The exr is fixed. Flexible foreign savings
* clears the current a/c of the bop
EXR.FX    = EXR0;
FSAV.LO   = -INF;
FSAV.UP   = +INF;
FSAV.L    = FSAV0;    );

*//////////////////////////////////////////*
* RPORT SETUP AND BASE REPORT  *
*//////////////////////////////////////////*
                <<SKIP>>
*END
```