

\$TITLE BOLIVIA CGE

* Made by Robert Faris, Harvard University
* for the Andean Competitiveness Project in Bolivia
* January 2002.

OPTION DECIMALS=4;

*##### SETS DECLARATION #####

SETS

I SECTORS

/ TAG	TRADITIONAL AGRICULTURE
MAG	MODERN AGRICULTURE
COC	COCA
PG	PETROLEUM AND GAS
MN	MINING
CONG	CONSUMPTION GOODS
INTG	INTERMEDIATE GOODS
CAPG	CAPITAL GOODS
EGW	UTILITIES
CT	CONSTRUCTION
IS	INFORMAL SERVICES
FS	FORMAL SERVICES
PUBS	PUBLIC SECTOR/

IVD(I) DOMESTIC INVESTMENT SECTORS
/MAG, PG, INTG, CAPG, CT, FS/

IVN(I) NON-INVESTMENT SECTORS
/TAG, MN, COC, CONG, EGW, IS, PUBS/

IC(I) CONSUMPTION SECTORS
/TAG, MAG, COC, CONG, INTG, CAPG, EGW, FS, IS, PUBS/

IST(I) INVENTORY ADJUSTMENT SECTORS
/TAG, MAG, PG, MN, CONG, INTG, CAPG, PUBS/

ICM(I) SECTORS WITH NO DOMESTIC CONSUMPTION
/PG, MN, CT/

IE(I) EXPORT SECTORS /TAG, MAG, COC, PG, MN, CONG, INTG, CAPG, EGW, FS/

IEN(I) NON-EXPORT SECTORS /CT, IS, PUBS/

INE(I) NON-IFF NON-IG EXPORT SECTORS
/TAG, MAG, MN, CONG, INTG, CAPG, EGW, FS/

IM(I) IMPORT SECTORS /TAG, MAG, PG, MN, CONG, INTG, CAPG, EGW, FS, IS, PUBS/

IMN(I) NON-IMPORT SECTORS /COC, CT/

IN(I) NON-IFF NON-IG SECTORS /TAG, MAG, MN, CONG, INTG, CAPG, EGW, CT, FS, IS/

IK(I) K USING SECTORS NON-IFF /MAG, MN, CONG, INTG, CAPG, EGW, CT, FS/

IKF(I) K USING SECTORS /MAG, COC, PG, MN, CONG, INTG, CAPG, EGW, CT, FS/

NK(I) NO K IN PROD /TAG, IS/

NISF(I) NON-IFF NO ISF IN PROD /MAG, EGW/

KLA(I) ALL FACTORS /MN, CONG, INTG, CAPG, CT, FS/

IFF(I) FOSSIL FUEL SECTORS /PG/

IFC(I) FOSSIL FUEL SECTORS /PG, COC/

ICOC(I) COCA /COC/

IG(I) PUBLIC SECTOR /PUBS/

IFG(I) PUBLIC FF AND COC /COC, PG, PUBS/

ING(I) NON-IG SECTORS /TAG,MAG,COC,PG, MN,CONG,INTG,CAPG,EGW,CT,FS,IS/
INFF(I) NON-IFF SECTORS /TAG,MAG,COC,MN,CONG,INTG,CAPG,EGW,CT,FS,IS,PUBS/

F FACTORS OF PRODUCTION

/SKILL SKILLED LABOR
UNSK-A UNSKILLED AGRICULTURAL LABOR
UNSK-U UNSKILLED NON-AGRICULTURAL LABOR
SHF SMALLHOLDER AGGREGATE FACTOR
INF INFORMAL-SMALLHOLDER AGGREGATE FACTOR
CAP CAPITAL/

CA(F) CAPITAL
/CAP/

LA(F) LABOR
/SKILL, UNSK-A, UNSK-U, SHF, INF/

LAB(F) /UNSK-A, UNSK-U, SHF, INF/

LL(LA) /SKILL, UNSK-U/

DDD Unused set to ensure that GAMS orders '0' before '1'
/0*20/

V Vintage years
/1*20/

VV(V) Years in which vintage production takes place
/1/

VC(V) Year in which vintage capital production coefficients are determined
/1/

INST INSTITUTIONS

/SH SMALLHOLDERS
AW AGRICULTURAL WORKERS
EMPR EMPLOYERS
NAW NON-AGRICULTURAL WORKERS
URI URBAN INFORMALS
EMPE EMPLOYEES
CPRIV PRIVATE ENTERPRISES
CPUB PUBLIC ENTERPRISES
GOV GOVERNMENT
ROW REST OF WORLD/

CINST(INST) INSTITUTIONS THAT CONSUME
/SH,AW,NAW,URI,EMPR,EMPE,GOV/

CNGINST(INST) NON-GOV INSTITUTIONS THAT CONSUME
/SH,AW,NAW,URI,EMPR,EMPE/

CNINST(INST) INSTITUTIONS THAT DON'T CONSUME
/CPRIV,CPUB,ROW/

NINST(INST) NON-GOVERNMENT DOMESTIC INSTITUTIONS
/SH,AW,NAW,URI,EMPR,EMPE,CPUB,CPRIV/

DINST(INST) DOMESTIC INSTITUTIONS
/SH,AW,NAW,URI,EMPR,EMPE,CPUB,CPRIV,GOV/

SUBSETS #####
ALIAS (I,J)

ALIAS (INST,JNST);
ALIAS (CINST,CCINST);
ALIAS (DINST,DDINST);
ALIAS (NINST,NNINST);

PARAMETER DECLARATION

PARAMETERS

*****PARAMETERS WITH A ZERO SUFFIX ARE FOR INITIALIZING VARIABLES OF THE SAME
NAME*****

E0(I)	EXPORTS
X0(I)	VOLUME OF DOMESTIC OUTPUT
D0(I)	DOMESTICALLY PRODUCED COMMODITY VOLUME
Q0(I)	AGGREGATE COMMODITY VOLUME
M0(I)	IMPORTS
PQ0(I)	COMMODITY PRICE
PD0(I)	DOMESTIC GOODS PRICE
PE0(I)	DOMESTIC PRICE OF EXPORTS
PX0(I)	AVERAGE OUTPUT PRICE
PM0(I)	DOMESTIC PRICE OF IMPORTS
PWM(I)	WORLD MARKET PRICE OF IMPORTS
PWE0(I)	WORLD MARKET PRICE OF EXPORTS
PINDEX0	CPI DEFLATOR
EXR0	EXCHANGE RATE
FSAV0	CURRENT ACCOUNT (= -FOREIGN SAVINGS)
YI0(INST)	INSTITUTIONAL INCOME
ISAV0(INST)	INSTITUTIONAL SAVINGS
IMPS0(INST)	MARGINAL PROPENSITY TO SAVE
PV0(I)	VALUE ADDED PRICE
PVV0(I)	AGGREGATE VALUE ADDED PRICE
VA0(I)	AGGREGATE VALUE ADDED
V0(I)	VALUE ADDED
PK0	CAPITAL GOODS PRICE BY SECTOR OF DESTINATION
IDT0	AGGREGATE INVESTMENT DEMAND
ID0(IVD)	SECTORAL INVESTMENT DEMAND
INVEST0	TOTAL INVESTMENT
FXDINV0	FIXED INVESTMENT
DST0(I)	CHANGE IN STOCKS
GOVCON0	GOVERNMENT CONSUMPTION
GOVSAV0	PUBLIC SAVINGS
TARIFF0	TOTAL IMPORT TARIFFS
STXR(I)	RATE FOR TOTAL INDIRECT TAXES
ITXR(INST)	INSTITUTIONAL TAX RATE
TM(I)	TARIFF RATES ON IMPORTS
FFTAX0	FOSSIL FUEL TAXES
RMTAX0	REMITTANCE TAXES
CT0(INST)	AGGREGATE CONSUMPTION GOOD
CN0(I,INST)	AGGREGATE DOMESTIC CONSUMPTION GOOD

PCT0(INST)	AGGREGATE CONSUMPTION GOOD PRICE
RHOT(I)	CET FUNCTION EXPONENT
RHOC(I)	ARMINGTON FUNCTION EXPONENT
RHOP(I)	PRODUCTION FUNCTION EXPONENT
KDS(I)	CAPITAL DEMAND SHARE
INT0(I)	INTERMEDIATE INPUT DEMAND
NT0(I)	AGGREGATE INPUT USE
NN0(I,J)	INPUT USE
IOF(I,J)	INPUT USE IN RESPECT TO AGGREGATE INPUT USE
PNT0(J)	PRICE OF AGGREGATE INPUTS
WFDIST0(I,F)	FACTOR PRICE SECTORAL PROPORTIONALITY CONSTANTS
WF0(F)	FACTOR PRICE AGGREGATE AVERAGE
FS0(F)	FACTOR SUPPLY AGGREGATE
YFSUM0	TOTAL FACTOR INCOME
YFSECT0(I)	FACTOR INCOME BY SECTOR
*##### COMPUTED PARAMETERS AS RATES, SHARES #####	
AC(I)	ARMINGTON FUNCTION SHIFT PARAMETER
AT(I)	CET FUNCTION SHIFT PARAMETER
ACP(I)	PRODUCTION FUNCTION SHIFT PARAMETER
AX(I)	PRODUCTION FUNCTION SHIFT PARAMETER
DELTA(I)	ARMINGTON FUNCTION SHARE PARAMETER
GAMMA(I)	CET FUNCTION SHARE PARAMETER
DELTAP	PRODUCTION FUNCTION SHARE PARAMETER
ALPHA(I,F)	PRODUCTION FUNCTION SHARE PARAMETER
SUMSH	SUM OF SHARE CORRECTION PARAMETER
SUMINSTSH(INST)	SUM OF SHARE FOR INST CONSUMPTION SHARES
TMREAL(I)	REAL TARIFF RATE
IO(I,J)	INPUT-OUTPUT COEFFICIENTS
ITRNS(INST,JNST)	INTER-INSTITUTIONAL TRANSFERS - SHARE OF INCOME
ITRNL(INST,JNST)	FIXED INTER-INSTITUTIONAL TRANSFERS
AE	INVESTMENT EFFICIENCY FUNCTION PARAMETER
BE	INVESTMENT EFFICIENCY FUNCTION PARAMETER
CE	INVESTMENT EFFICIENCY FUNCTION PARAMETER
AGG	INVESTMENT EFFICIENCY FUNCTION PARAMETER
BGG	INVESTMENT EFFICIENCY FUNCTION PARAMETER
CGG	INVESTMENT EFFICIENCY FUNCTION PARAMETER
TFP(I)	TOTAL FACTOR PRODUCTIVITY COEFFICIENT
XPG	FOSSIL FUEL SECTOR PRODUCTION LEVEL
WFACTOR	WASTE PROPORTION FOR FF REVENUES
AU(LA)	UNEMPLOYMENT EQUATION COEFFICIENT
BU(LA)	UNEMPLOYMENT EQUATION COEFFICIENT
DEPFF	DEPRECIATION FOR FOSSIL FUEL CAPITAL STOCKS FOR TAX PURPOSES
DEP	CAPITAL DEPRECIATION RATE
PGNR	RATIO OF PETROLEUM OUTPUT TO NATURAL GAS OUTPUT
GREVBM	BENCHMARK FOR GOVT FOSSIL FUEL REVENUES
AFF	LABOR STOCK COEFFICIENT
BETAFF	LABOR STOCK EXPONENT
BETACOC	FACTOR USE FOR COCA SECTOR
BETAPUB(LA)	PUBLIC SECTOR LABOR REQUIREMENTS

;

TABLE INSTPAR(*,INST) MISCELLANEOUS INSTITUTIONAL PARAMETERS

	SH	AW	EMPR	NAW	URI	EMPE	CPRIV
CPUB	GOV		ROW				
YI	4222.6245	594.7780	13099.7540	2370.0390	4476.2344	10979.3833	
5613.5400	2991.9999	10516.1896	13644.4411				
ISAV	34.9565	10.1190	431.1569	-23.0521	45.2985	1008.6127	
641.4860	2012.0919	1081.3742	2933.4673				
PCT	1	1	1	1	1	1	1
1	1		1				

;

TABLE ICON(I,INST) INSTITUTIONAL CONSUMPTION

	SH	AW	EMPR	NAW	URI	EMPE	CPRIV
CPUB	GOV						
TAG	519.1497	61.7340	542.1648	197.4553	342.6935	483.7752	0.0000
0.0000	0.0000						
MAG	48.7881	6.9619	95.1832	31.8888	55.3446	83.8298	0.0000
0.0000	0.0000						
COC	33.4278	4.7700	7.2227	8.3952	14.5703	8.7337	0.0000
0.0000	0.0000						
PG	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000						
MN	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000						
CONG	1561.4589	235.4042	2667.6198	818.1307	1425.9787	2335.8306	0.0000
0.0000	0.0000						
INTG	289.9901	44.0707	839.1067	141.4990	288.8129	728.7442	0.0000
0.0000	0.0000						
CAPG	166.7203	25.3370	482.4170	81.3502	166.0435	418.9677	0.0000
0.0000	0.0000						
EGW	83.7785	13.6562	379.9020	55.9326	125.6249	335.5715	0.0000
0.0000	0.0000						
CT	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000						
IS	121.2385	17.5664	1174.7447	370.9246	693.5437	1152.7805	0.0000
0.0000	0.0000						
FS	1144.3446	165.5677	3988.5179	642.1134	1200.6045	3649.9095	0.0000
0.0000	0.0000						
PUBS	39.3335	5.6909	209.2483	30.9703	57.9073	190.3219	0.0000
0.0000	5794.8394						

;

TABLE PARM(*,I) MISCELLANEOUS SECTOR PARAMETERS

	TAG	MAG	COC	PG	MN	FS	CONG
INTG							
PUBS							
KDS	0	131.2974	0	323.161	0		0
136.1118		3596.6628	0	3329.7242	0	382.4475	
0							
DST	-78.7954	39.8629	0	-55.084	-13.318		
60.007		79.2954	244.1379	0	0	0	
0	0.0004						

;

PARAMETER SCALRES(*)

/GOVCON 5794.8394

GOVSAV 1081.3742
 INVEST 8175.5109
 FXDINV 7899.40470
 FSAV 2933.4673
 IMPT 12813.2086
 EXPT 8786.3987
 ROY 436.156
 FFTAX 16.2000
 RMTAX 5.8320
 DEP 0.05
 EXR 1
 PINDEX 1
 PK 1
 /;

TABLE ITRNI(INST,JNST) INSTITUTION TO INSTITUTION TRANSFERS

	SH	AW	EMPR	NAW	URI	EMPE	CPRIV	CPUB
GOV	ROW							
SH	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
74.1000	23.8370							
AW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11.2390	3.6150							
EMPR	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1400.2880	75.7780
2249.2280	113.5377							
NAW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
41.5900	13.3790							
URI	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
78.5510	25.2690							
EMPE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1422.9070	77.0020
0.0000	54.4680							
CPRIV	0.0000	0.0000	448.2330	0.0000	0.0000	455.4730	0.0000	172.0540
123.0420	477.4660							
CPUB	179.4380	0.0000	0.0000	0.0000	59.8120	0.0000	617.0050	0.0000
387.1140	282.8270							
GOV	0.0000	3.9000	1834.2370	14.4310	0.0000	126.8330	877.6270	566.2200
0.0000	930.1764							
ROW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	654.2270	88.8540
675.1120	0.0000							

;

PARAMETERS

IYFSUM(F) HOUSEHOLD INCOME FACTOR SUM
 IYFS(INST,F) HOUSEHOLD INCOME FACTOR SHARE
 YF0(F) FACTOR INCOME SUMMED OVER SECTOR
 ;

YF0(F) = SUM(I, FCTRY(I, F));
 IYFSUM(F) = SUM(INST, IYF(INST, F));
 IYFS(INST, F) \$ IYF(INST, F) = IYF(INST, F) / YF0(F);

TABLE ELASTICITY(*, I) SECTORAL ELASTICIES

	TAG	MAG	COC	PG	MN	CONG	INTG	CAPG	EGW
CT	IS	FS	PUBS						
RHOC	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
1.30	1.30	1.30	1.30						

RHOT	4.00	4.00	0.50	4.00	4.00	4.00	4.00	4.00	4.00
	4.00	4.00	4.00	4.00					
RHOP	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
	1.30	1.30	1.30	1.30					

;

**THE FOLLOWING SET THE VALUES FOR THE PARAMETERS CALIBRATING THE MODEL TO MATCH THE SAM

PARAMETERS

*### CALCULATION OF SHARES

DSTR(I)	CHANGE IN STOCKS AS A SHARE OF OUTPUT
ICONS(I,INST)	INSTITUTIONAL CONSUMPTION SHARE
SUMICON(INST)	SUM OF HOUSEHOLD CONSUMPTION
ROY0	ROYALTIES ON FOSSIL FUELS
ROYR	ROYALTY RATE
IMPT0	TOTAL IMPORTS (INCLUDING TARIFFS)
EXPT0	TOTAL EXPORTS
KSVL(I,V)	CAPITAL SUPPLY FROM LAST PERIOD
KSFL(I)	CAPITAL SUPPLY FROM LAST PERIOD
FSLAB(LA)	LABOR SUPPLY
FSLAB2(LA)	LABOR SUPPLY INCLUDING UNEMPLOYED
FST	LABOR SUPPLY FOR UNSKILLED LABOR
FST2	LABOR SUPPLY FOR SMALLHOLDERS AND INFORMAL LABOR
FST3	LABOR SUPPLY FOR NO-UNEMPLOYMENT VERSION
FST4	LABOR SUPPLY FOR NO-UNEMPLOYMENT VERSION
UNEMR	BASE UNEMPLOYMENT RATE
VFCOEF(IK,F,V)	FACTOR LEONTIEF COEFFICIENTS FOR VINTAGE PRODUCTION
VNTCOEF(IK,V)	INTERMEDIATES LEONTIEF COEFFICIENTS FOR VINTAGE PRODUCTION
OMEGA	CAPITAL MALEABILITY COEFFICIENT
IDTSCL(I)	SECTORAL INVESTMENTS MADE IN PREVIOUS PERIOD

;

TFP(IN)	= 1;
OMEGA	= 0;
UNEMR	= .04;
FSLAB(LA)	= SUM(I,FCTRES1(I,LA));
FSLAB2(LA)	= FSLAB(LA)/(1 - UNEMR);
FST	= FSLAB2('UNSK-A') + FSLAB2('UNSK-U');
FST2	= FSLAB2('SHF') + FSLAB2('INF');
FST3	= FSLAB('UNSK-A') + FSLAB('UNSK-U');
FST4	= FSLAB('SHF') + FSLAB('INF');
KSVL(I,V)	= 0;

FCTRES1(I,'CAP')	= FCTRY(I,'CAP')*7;
KSFL(I)	= FCTRES1(I,'CAP');
IDTSCL(I)	= 0;
VFCOEF(IK,F,V)	= .1;
VNTCOEF(IK,V)	= .1;

EXR0	= SCALRES('EXR');
FSAV0	= SCALRES('FSAV');
GOVCON0	= SCALRES('GOVCON');
INVEST0	= SCALRES('INVEST');
FXDINV0	= SCALRES('FXDINV');

```

PINDEX0          = SCALRES('PINDEX');
IMPT0           = SCALRES('IMPT');
EXPT0          = SCALRES('EXPT');
DST0(I)        = PARM('DST',I);
PK0            = SCALRES('PK');
DEP            = SCALRES('DEP');

IDT0           = FXDINV0;
KDS(I)         = PARM('KDS',I)/IDT0;

YI0(INST)       = INSTPAR('YI',INST);

ITRNS(INST,DINST)= ITRNI(INST,DINST)/YI0(DINST);
ITRNL(INST,'ROW')= ITRNI(INST,'ROW');
ITRNS(INST,'ROW')= 0;

YI0(NINST)     = SUM(F,YF0(F)*IYFS(NINST,F))
                + SUM(DINST,ITRNS(NINST,DINST)*YI0(DINST))
                + SUM(INST,ITRNL(NINST,INST));
CT0(INST)      = SUM(I,ICON(I,INST));

IMPS0(NINST)   = INSTPAR('ISAV',NINST)/(YI0(NINST));
ICONS(I,CINST) = ICON(I,CINST)/CT0(CINST);

E0(I)          = SECTRES('E',I);

PX0(I)         = SECTRES('PX',I);
PQ0(I)         = SECTRES('PQ',I);
PE0(I)         = SECTRES('PE',I);
PM0(I)         = SECTRES('PM',I);
PCT0(INST)     = INSTPAR('PCT',INST);

PD0(I)         = SECTRES('PD',I);
X0(I)          = SECTRES('X',I);
M0(I)          = SECTRES('M',I);

ROY0           = SCALRES('ROY');
ROYR           = ROY0/X0('PG');

GREVBM         = 1200;
BETAFF(LL)     = .01;
AFF(LL)        = FCTRES1('PG',LL) - BETAFF(LL)*X0('PG');

BETAPUB(LA)    = FCTRES1('PUBS',LA)/X0('PUBS');
BETACOC(F)     = FCTRES1('COC',F)/X0('COC');

RIW            = .06;
SFUNDI         = 0;

PNT0(J)        = 1;

IDTL           = 0;
DSTR(I)        = DST0(I)/X0(I);
D0(I)          = X0(I) - E0(I);

RHOT(I)        = (1/ELASTICITY('RHOT',I)) + 1;
RHOC(I)        = (1/ELASTICITY('RHOC',I)) - 1;

```

```

RHOP(I)          = (1/ELASTICITY('RHOT',I)) - 1;

TM(IM)           = SECTRES('TM',IM)/(M0(IM) - SECTRES('TM',IM));
STXR(I)         = SECTRES('TX',I)/(PX0(I)*X0(I));
FFTAX0          = SCALRES('FFTAX');
RMTAX0          = SCALRES('RMTAX');

PWE0(I)         = PE0(I)/EXR0;
PWM(I)          = PM0(I)/(1+TM(I))*EXR0;
TMREAL(I)       = TM(I)*PWM(I)*EXR0;
IO(I,J)         = IOT(I,J)/X0(J);
INT0(I)         = SUM(J,IO(I,J)*X0(J));
NN0(I,J)        = IO(I,J)*X0(J);
NT0(J)          = SUM(I,NN0(I,J));
IOF(I,J)        = NN0(I,J)/NT0(J);

PV0(I)          = (PX0(I)*(1.0-STXR(I)-ROYR$IFF(I))*X0(I)
                 - PNT0(I)*NT0(I) - FFTAX0$IFF(I)- RMTAX0$IFF(I))/X0(I);

FSAV0           = SUM(IM,M0(IM)*PWM(IM))+SUM(INST,ITRNS('ROW',INST)*YI0(INST))
                 - SUM(IE,E0(IE)*PE0(IE))- SUM(INST,ITRNL(INST,'ROW'));

FS0(F)          = SUM(I,FCTRES1(I,F));
YF0(F)          = SUM(I,FCTRY(I,F));
YFSUM0          = SUM(F,YF0(F));
YFSECT0(I)      = SUM(F,FCTRY(I,F));

WF0(F)          = (YF0(F)/FS0(F))$FS0(F);
WFDIST0(I,F)$FCTRES1(I,F)
                = (FCTRY(I,F)/FCTRES1(I,F))/WF0(F);
WFDIST0(I,F)$ (FCTRES1(I,F) EQ 0)
                = 1;

**EXPORTS**
GAMMA(IE)       = 1/(1+PD0(IE)/PE0(IE)*(E0(IE)/D0(IE))**(RHOT(IE)-1));

AT(IE)          = X0(IE)/(GAMMA(IE)*E0(IE)**RHOT(IE)+(1-GAMMA(IE))*
                        D0(IE)**RHOT(IE))**(1/RHOT(IE));

**IMPORTS**
DELTA(I)        = (PM0(I)/PD0(I))*(M0(I)/D0(I))**(1 + RHOC(I));
DELTA(I)        = DELTA(I)/(1 + DELTA(I));
Q0(I)           = D0(I) + M0(I);

AC(I)           = Q0(I)/(DELTA(I)*M0(I)**(-RHOC(I))
                    + (1 - DELTA(I))*D0(I)**(-RHOC(I))**(-1/RHOC(I)));

Q0(IM)          = AC(IM)*(DELTA(IM)*M0(IM)**(-RHOC(IM))
                    + (1-DELTA(IM))*D0(IM)**(-RHOC(IM))**(-1/RHOC(IM)));

M0(IM)          = D0(IM)*((PD0(IM)/PM0(IM))*(DELTA(IM)
                    / (1-DELTA(IM))))**(1/(RHOC(IM)+1));

ALPHA(I,F)      = (WFDIST0(I,F)*WF0(F)*FCTRES1(I,F))/YFSECT0(I);

VA0(I)          = PROD(F,(FCTRES1(I,F))**ALPHA(I,F));
PVV0(I)         = SUM(F,WFDIST0(I,F)*WF0(F)*FCTRES1(I,F))/VA0(I);

```

$DELTA P(I) = (PVV0(I)/PNT0(I)) * (VA0(I)/NT0(I))^{(1 + RHOP(I))};$
 $DELTA P(I) = DELTA P(I) / (1 + DELTA P(I));$

$ACP(I) = X0(I) / (DELTA P(I) * VA0(I)^{(-RHOP(I))} + (1 - DELTA P(I)) * NT0(I)^{(-RHOP(I))})^{(-1/RHOP(I))};$

$DEPFF = PX0('PG') * X0('PG') * (1 - STXR('PG') - ROYR) - PNT0('PG') * NT0('PG') - SUM(LA, WF0(LA) * WFDIST0('PG', LA) * FCTRES1('PG', LA)) - 64.8;$

VARIABLES

#####NOMINAL VARIABLES#####

EXR	EXCHANGE RATE (\$B PER WORLD \$)
PINDEX	PRICE INDEX
CPI	CONSUMER PRICE INDEX
PD(I)	DOMESTIC PRICES
PE(I)	DOMESTIC PRICE OF EXPORTS
PM(I)	DOMESTIC PRICE OF IMPORTS
PX(I)	AVERAGE OUTPUT PRICE BY SECTOR
PQ(I)	PRICE FOR DOMESTIC COMMODITIES
PK	PRICE OF AGGREGATE INVESTMENT DEMAND
PV(I)	VALUE ADDED PRICE BY SECTOR
PVV(I)	PRICE OF VALUE-ADDED FOR CES PRODUCTION FUNCTION
VA(I)	VALUE ADDED FOR CES PRODUCTION FUNCTION
SSTAX	TOTAL SECTORAL INDIRECT TAXES
ROYT	ROYALTIES FROM FOSSIL FUELS
FFGREV	TOTAL GOVERNMENT REVENUE FROM FOSSIL FUEL TAXES AND ROYALTIES
FFTAX	FOSSIL FUEL PROFIT TAX
RMTAX	REMITTANCE TAX
YI(INST)	INSTITUTIONAL INCOME
ISAV(INST)	INSTITUTIONAL SAVINGS
IMPS(INST)	MARGINAL PROPENSITY TO SAVE
WF(F)	AVERAGE FACTOR PRICE
WFI(F)	AVERAGE FACTOR PRICE
YF(F)	FACTOR INCOME
SAVING	TOTAL SAVINGS
INVEST	TOTAL INVESTMENT
FXDINV	FIXED INVESTMENT
DST(I)	CHANGE IN STOCKS
TARIFF	TARIFF REVENUE
GDPVA	VALUE ADDED IN MARKET PRICES: GDP

#####REAL VARIABLES#####

D(I)	DOMESTIC SALES OF DOMESTIC OUTPUT
E(I)	EXPORTS BY SECTOR
Q(I)	AGGREGATE COMMODITY
M(I)	IMPORTS BY SECTOR
IMPT	TOTAL IMPORTS
EXPT	TOTAL EXPORTS
X(I)	DOMESTIC OUTPUT BY SECTOR

XF(I)	FLEXIBLE CAPITAL OUTPUT BY SECTOR
XV(I,V)	VINTAGE CAPITAL OUTPUT BY SECTOR AND VINTAGE
UNEM(LA)	EXCESS LABOR
XKV(I,V)	IDLE CAPITAL FOR VINTAGE PRODUCTION
XKF(I)	IDLE CAPITAL FOR FLEXIBLE PRODUCTION
KF(I)	CAPITAL DEMAND FOR FLEXIBLE PRODUCTION
LF(I,LA)	LABOR DEMAND FOR FLEXIBLE PRODUCTION
FSLABOR(LA)	LABOR SUPPLY OF TOTAL UNSKILLED LABOR
LOSS(I,V)	SLACK VARIABLE TO ENSURE NO VIOLATION OF PRODUCTION
RESTRICTIONS	
LOSS2(I)	SLACK VARIABLE TO ENSURE NO VIOLATION OF PRODUCTION
RESTRICTIONS	
L(I,LA)	TOTAL SECTORAL LABOR DEMAND
K(I)	TOTAL SECTORAL CAPITAL DEMAND
LV(I,LA,V)	LABOR DEMAND FOR VINTAGE PRODUCTION
KV(I,V)	CAPITAL DEMAND FOR VINTAGE PRODUCTION
WFDIST(I,F)	FACTOR PRICE SECTORAL PROPORTIONALITY RATIOS
WFDISTI(I,F)	FACTOR PRICE SECTORAL PROPORTIONALITY RATIOS FOR INVESTMENT
DECISION	
WFDISTV(IK,F,V)	FACTOR PRICE SECTORAL PROPORTIONALITY COEFFICIENTS
CT(INST)	AGGREGATE CONSUMPTION GOOD
CN(I,INST)	DOMESTICALLY PRODUCED CONSUMPTION GOODS
CD(I)	INSTITUTIONAL AGGREGATE OF FINAL DEMAND FOR PRIVATE CONSUMPTION
PCT(INST)	PRICE OF AGGREGATE CONSUMPTION GOOD
ID(I)	FINAL DEMAND FOR PRODUCTIVE INVESTMENT
IDT	AGGREGATE INVESTMENT DEMAND
IDTSC(I)	INVESTMENT IN SECTOR OF DESTINATION
INT(I)	INTERMEDIATE USES
NN(I,J)	INTERMEDIATES
NT(J)	TOTAL INTERMEDIATE USE
NTF(J)	INTERMEDIATES FOR FLEXIBLE PRODUCTION
NTV(J,V)	INTERMEDIATES FOR VINTAGE PRODUCTION
PNT(J)	PRICE OF AGGREGATE INTERMEDIATE GOODS
RGDP	REAL GDP
SFUND	STABILIZATION FUND
SFD	STABILIZATION FUND DEPOSITS
SFW	STABILIZATION FUND WITHDRAWALS
SURPLUS	SLACK VARIABLE TO PREVENT VIOLATION OF SF RULES
SHORTFALL	SLACK VARIABLE TO PREVENT VIOLATION OF SF RULES
EFF	EFFICIENCY FACTOR FOR CREATION OF CAPITAL FROM INVESTMENT
EFFG	EFFICIENCY FACTOR FOR CREATION OF CAPITAL FROM INVESTMENT

#####VARIABLES IN WORLD PRICES#####*

FSAV CURRENT ACCOUNT
PWE(I) WORLD PRICE OF EXPORTS ;

VARIABLE INITIALIZATIONS #####
IDTSC.L(I) = 0;
FSAV.L = FSAV0;

```

EXR.L          = EXR0;

INVEST.L      = INVEST0;
FXDINV.L     = FXDINV0;
DST.L(I)     = DST0(I);
PINDEX.L     = PINDEX0;
CPI.L        = 1;
IMPS.L(INST) = IMPS0(INST);

IMPT.L       = IMPT0;
EXPT.L       = EXPT0;
NN.L(I,J)    = IO(I,J)*X0(J);
NT.L(J)      = SUM(I,NN.L(I,J));

NTF.L(J)     = NT.L(J);
NTV.L(J,V)   = 0;
PNT.L(J)     = PNT0(J);
PM.L(I)      = PM0(I);
PD.L(I)      = PD0(I);
PX.L(I)      = PX0(I);
PQ.L(I)      = PQ0(I);
PCT.L(INST)  = PCT0(INST);
PE.L(I)      = PE0(I);
PM.L(I)      = PM0(I);
X.L(I)       = X0(I);
M.L(I)       = M0(I);
Q.L(I)       = Q0(I);

XF.L(IN)     = X.L(IN);
XV.L(I,V)    = 0;
E.L(I)       = E0(I);
XPG          = X.L('PG');
KF.L(I)      = FCTRES1(I,'CAP');
LF.L(I,LA)   = FCTRES1(I,LA);
L.L(I,LA)    = FCTRES1(I,LA);
LV.L(I,LA,V) = 0;
KV.L(I,V)    = 0;
K.L(I)       = KF.L(I);
UNEM.L(LA)   = FSLAB2(LA) - SUM(I, L.L(I,LA));
FSLABOR.L(LA) = FSLAB2(LA);
SFUND.L      = 0;
SFD.L        = 0;
SFW.L        = 0;

YF.L(F)      = SUM(I,FCTRY(I,F));

FFTAX.L      = FFTAX0;
RMTAX.L      = RMTAX0;

D.L(I)       = X.L(I)-E.L(I);
PWE.L(I)     = PE.L(I)/EXR.L;
PV.L(I)      = (PX.L(I)*(1.0-STXR(I)-ROYR$IFF(I))*X.L(I)
               - PNT.L(I)*NT.L(I) - FFTAX.L$IFF(I)- RMTAX.L$IFF(I))/X.L(I);
WF.L(F)      = YF.L(F)/SUM(I,FCTRES1(I,F));
WFI.L(F)     = WF.L(F);
WFDIST.L(I,F) = WFDIST0(I,F);
WFDISTI.L(I,F) = 1;

```

```

WFDISTV.L(IK,F,V)= 1;
TARIFF.L          = SUM(IM, PWM(IM)*M.L(IM)*TM(IM)*EXR.L);

SSTAX.L           = SUM(INFF, STXR(INFF)*PX.L(INFF)*X.L(INFF));

ROYT.L            = ROYR*PX.L('PG')*X.L('PG');

FFGREV.L          = ROYT.L + FFTAX.L + RMTAX.L
                  + STXR('PG')*PX.L('PG')*X.L('PG');

INT.L(I)          = SUM(J, IO(I,J)*X.L(J));

ID.L(I)           = KDS(I)*IDT0;
IDT.L             = IDT0;
PK.L              = PK0;

YI.L(INST)        = YI0(INST);

YI.L(NINST)       = SUM(F, YF.L(F)*IYFS(NINST,F))
                  + SUM(DINST, ITRNS(NINST,DINST)*YI.L(DINST))
                  + SUM(INST, ITRNL(NINST,INST));

YI.L('GOV')      = SSTAX.L + TARIFF.L + FFGREV.L
                  + SUM(NINST, ITRNS('GOV',NINST)*YI.L(NINST))
                  + SUM(INST, ITRNL('GOV',INST));

ISAV.L(NINST)     = IMPS.L(NINST)*YI.L(NINST);

CT.L(CINST)       = YI.L(CINST)*(1.0-IMPS.L(CINST)
                  - SUM(INST, ITRNS(INST,CINST)))/PCT.L(CINST);

CT.L('GOV')      = GOVCON0;

CN.L(IC,CINST)    = ICONS(IC,CINST)*CT.L(CINST);

CD.L(IC)          = SUM(INST, CN.L(IC,INST));

Q.L(I)            = INT.L(I) + CD.L(I)$IC(I) + ID.L(I) + DST.L(I);

ISAV.L('GOV')    = YI.L('GOV') - PCT.L('GOV')*CT.L('GOV')
                  - SUM(INST, ITRNS(INST,'GOV')*YI.L('GOV'));

SAVING.L          = SUM(DINST, ISAV.L(DINST)) + FSAV.L;

GDPVA.L           = SUM(I, PV.L(I)*X.L(I)) + SSTAX.L + TARIFF.L + FFGREV.L;

RGDP.L           = SUM(I, CD.L(I) + DST.L(I) + ID.L(I))
                  + SUM(IE, E.L(IE)) - SUM(IM, (1 - TMREAL(IM))*M.L(IM));

*OPTION DECIMALS=8;

FFTAX.L           = .25*((PX.L('PG')*X.L('PG')
                  *(1- STXR('PG')- ROYR))
                  - PNT.L('PG')*NT.L('PG')
                  - SUM(LA, WF.L(LA)*WFDIST.L('PG',LA)*LF.L('PG',LA))
                  - DEFFF*PINDEX.L);

```

RMTAX.L = .12*((PX.L('PG')*X.L('PG')
 *(1- STXR('PG')- ROYR))
 - PNT.L('PG')*NT.L('PG')
 - SUM(LA, WF.L(LA)*WFDIST.L('PG',LA)*LF.L('PG',LA))
 - DEPFF*PINDEX.L - FFTAX.L);

AE = 20;
 BE = 750;
 CE = 1/(1 + BE*EXP(-AE*(FXDINV0/RGDP.L))) + 1;
 EFF.L = CE - 1/(1 + BE*EXP(-AE*(FXDINV0/RGDP.L)));
 *CALIBRATED AT RATIO OF .2 TO REFLECT A RATIO CLOSER TO HISTORIC LEVELS
 *CE = 1/(1 + BE*EXP(-AE*(.2))) + 1;
 *EFF.L = CE - 1/(1 + BE*EXP(-AE*(.2)));

AGG = 20;
 BGG = 750;
 CGG = 1/(1 + BGG*EXP(-AGG*(ISAV.L('GOV')/SAVING.L))) + 1;
 EFFG.L = CGG - 1/(1 + BGG*EXP(-AGG*(ISAV.L('GOV')/SAVING.L)));

BU(LA) = -.1;
 AU(LA) = 1/((UNEM.L(LA)/FSLAB2(LA))**BU(LA));

*WFA - USED TO SIMULATE INVESTMENTS THAT DO NOT PRODUCE USEFUL CAPITAL
 *WFACTOR = .5;
 WFACTOR = 0;

PINDEX.L = GDPVA.L/RGDP.L;

VA.L(IN) = VA0(IN);
 PVV.L(IN) = PVV0(IN);
 XKV.L(I,V) = 0;
 LOSS.L(I,V) = 0;
 LOSS2.L(I) = 0;

EQUATIONS

PRICE BLOCK

PMDEF(I) DOMESTIC PRICE OF IMPORTED INVENTORY GOODS DETERMINATION
 PEDEF(I) DOMESTIC EXPORT PRICES
 PXDEF(I) VALUE OF SALES OF DOMESTIC OUTPUT
 PQDEF(I) DOMESTIC COMMODITY MARKET PRICES
 PVDEF(I) DEFINITION OF ACTIVITY PRICES
 PINDEXDEF DEFINITION OF GENERAL PRICE LEVEL
 CPIDEF DEFINITION OF CONSUMER PRICE LEVEL
 PRICFIXEQ(I) SETS DOMESTIC PRICES EQUAL TO EXPORT PRICES
 PPUBSEQ PUBLIC SECTOR EXPENDITURE ON LABOR AND INTERMEDIATES

PRODUCTION BLOCK

ACTIVITY(I) PRODUCTION FUNCTION FOR FLEXIBLE PRODUCTION
 TOTACT(I) TOTAL PRODUCTION - SUM OF FLEXIBLE AND VINTAGE
 VAEQ(I) COBB-DOUGLAS FUNCTION LABOR AND CAPITAL
 VA2EQ COBB-DOUGLAS FUNCTION LABOR AND CAPITAL
 VA3EQ COBB-DOUGLAS FUNCTION LABOR AND CAPITAL
 VA4EQ COBB-DOUGLAS FUNCTION LABOR AND CAPITAL
 VA5EQ COBB-DOUGLAS FUNCTION LABOR AND CAPITAL
 VAEQ2(IN) COST-MIN FOR CES PRODUCTION FUNCTION
 PVVEQ(IN) PRICE OF VALUE ADDED FOR CES PRODUCTION FUNCTION

PROFITMAX(I,LA) F.O.C FOR PROFIT MAXIMIZATION
 DISTF(I) DISTRIBUTION OF REVENUE TO FACTORS FOR NON-FOSSIL FUEL SECTORS
 DISTC(I) COST STRUCTURE FOR COCA SECTOR
 CPROD(LA,ICOC) COCA FACTOR USE
 CPROD2(CA,ICOC) COCA FACTOR USE
 DISTFF(IFF) DISTRIBUTION OF REVENUE TO FACTORS FOR FOSSIL FUELS
 DISTV(IK,V) DISTRIBUTION OF REVENUE FOR VINTAGE PRODUCTION
 VPROD(IK,V) FIXED COEFFICIENT CAPITAL USE FOR FLEX. PROD.
 VPROD2(IK,LA,V) FIXED COEFFICIENT LABOR USE FOR FLEX. PROD.
 VPROD3(IK,V) FIXED COEFFICIENT DOMESTIC INTERMEDIATE USE FOR FLEX. PROD.
 FFPROD(LA) LABOR USE FOR FOSSIL FUEL PRODUCTION
 PUBPROD(LA) LABOR USE FOR PUBLIC SECTOR
 ARMINGTON(IM) ARMINGTON FUNCTION FOR IMPORTS
 ARMINGTON2(IMN) ARMINGTON ANALOG FOR NON-IMPORT SECTORS
 COSTMIN(IM) COST MINIMIZATION
 CET1(I) CET FUNCTION FOR IFC
 CET2(INE) DOMESTIC SALES FOR EXPORT SECTORS
 CET3(IEN) DOMESTIC SALES FOR NON-EXPORT SECTORS
 ESUPPLY(INE) EXPORT SUPPLY (FIRST ORDER CONDITION)
 PGEXPORTS FOSSIL FUEL EXPORTS

INTERMEDIATES BLOCK

INTEQ(I) TOTAL INTERMEDIATE USE
 NNEQ(I,J) INTERMEDIATE USE
 NT2EQ(IFG) INTERMEDIATE USE FOR GOV AND FF
 NTEQ(I) TOTAL INTERMEDIATE USE
 PNTEQ(I) PRICE OF AGGREGATE INTERMEDIATE USE

FACTORS BLOCK

YFKEQ CAPITAL INCOME
 YFLEQ(LA) LABOR INCOME

 FKTEQ(I) TOTAL CAPITAL USE
 CAPEQ(I,V) CAPITAL BALANCE FOR VINTAGE CAPITAL
 CAP2EQ(I) CAPITAL BALANCE FOR FLEXIBLE CAPITAL
 KVEQ(I,V) VINTAGE CAPITAL NON-NEGATIVE RESTRICTION
 KFEQ(I) FLEXIBLE PRODUCTION NON-NEGATIVE RESTRICTION
 KSFEQ(I) CAPITAL BALANCE FOR PRODUCTION DECISION
 XKVEQ(I,V) RETURN TO VINTAGE CAPITAL NON-NEGATIVE RESTRICTION
 XKFEQ(I) RETURN TO FLEXIBLE CAPITAL NON-NEGATIVE RESTRICTION
 UNEMEQ(LA) UNEMPLOYMENT EQUATION
 FLEQ(LA) LABOR SUPPLY
 FL2EQ SKILLED LABOR BALANCE
 FL3EQ UNSKILLED LABOR BALANCE
 FL4EQ INFORMAL SECTOR LABOR BALANCE
 FL5EQ CONSTANT WAGE RATIOS BETWEEN UNSKILLED LABOR SECTORS
 FL6EQ CONSTANT WAGE RATIOS BETWEEN INFORMAL LABOR SECTORS
 FLTEQ(I,LA) TOTAL LABOR USE
 WFDISTVEQ(I,LA,V) WAGE RATES EQUAL ACROSS DIFFERENT SECTORS

YEQ(INST) HOUSEHOLD INCOME

SAVING AND CONSUMPTION BLOCK

SAVEQ(INST)
 CTEQ(INST) TOTAL CONSUMPTION
 CNEQ(I,INST) PRIVATE CONSUMPTION DEMAND BY HOUSEHOLDS
 CDEQ(I) TOTAL PRIVATE CONSUMPTION

PCTEQ(INST) AGGREGATE CONSUMPTION GOOD PRICE

GOVERNMENT AND TAXES BLOCK

GOVYEQ FEDERAL GOVERNMENT REVENUE
GOVSAVEQ GOVERNMENT SAVINGS
STAXDEF TOTAL INDIRECT SECTORAL TAXES
TARIFFDEF TARIFF REVENUE
FFTAXEQ PROFIT TAXES ON FOSSIL FUELS
RMTAXEQ REMITTANCE TAXES
FFGREVEQ TOTAL GOVERNMENT REVENUE FROM FOSSIL FUELS
ROYTEQ ROYALTIES FROM FOSSIL FUEL

IEQ TOTAL NOMINAL INVESTMENT
IDEQ(IVD) INVESTMENT DEMAND SHARES BY SECTOR OF ORIGIN
PKTEQ PRICE OF INVESTMENT
FIXEDINV INVESTMENT BALANCE
DSTEQ(IST) CHANGE IN STOCKS
EFFEQ CAPITAL CREATION FROM INVESTMENT EFFICIENCY EQUATION
EFF2EQ CAPITAL CREATION FROM INVESTMENT EFFICIENCY EQUATION

EQUIL(I) GOODS MARKET EQUILIBRIUM
IMPTEQ TOTAL IMPORTS
EXPTEQ TOTAL EXPORTS
CAEQ CURRENT ACCOUNT BALANCE
TOTSAV TOTAL SAVINGS
GDPY TOTAL VALUE ADDED INCLUDING INDIRECT TAXES
GDPR REAL GDP
SFUNDEQ STAB. FUND ACCUMULATION
SFUND2EQ STAB. FUND DEPOSITS
SFUND3EQ STAB. FUND WITHDRAWALS
SFUND4EQ STAB. FUND UPPER SIZE LIMIT
SFUND5EQ STAB. FUND WITHDRAWAL LIMIT

*WALRAS LAW EQUATION

;

PRICE BLOCK

PMDEF(IM).. PM(IM) =E= PWM(IM)*EXR*(1+TM(IM));

PEDEF(IE).. PE(IE) =E= PWE(IE)*EXR;

PXDEF(I).. PX(I)*X(I) =E= PD(I)*D(I) + (PE(I)*E(I))\$IE(I);

PQDEF(I).. PQ(I)*Q(I) =E= PD(I)*D(I) + PM(I)*M(I)\$IM(I);

PVDEF(I).. PV(I)*X(I) =E= PX(I)*(1.0-STXR(I)-ROYR\$IFF(I))*X(I)
 - PNT(I)*NT(I)
 - FFTAX\$IFF(I)
 - RMTAX\$IFF(I);

PINDEXDEF.. PINDEX*RGDP =E= GDPVA;

CPIDEF.. CPI =E= SUM(CINST, PCT(CINST)*CT(CINST))
 /SUM(CINST, CT(CINST));

PRICFIXEQ(IFF).. PD(IFF) =E= PE(IFF);

```

PPUBSEQ..          PX('PUBS')*X('PUBS')*(1-STXR('PUBS')) =E=
                   PNT('PUBS')*NT('PUBS')
                   + SUM(LA,WF(LA)*WFDIST('PUBS',LA)*LF('PUBS',LA));

##### PRODUCTION AND EXPORTS BLOCK #####

ACTIVITY(IN)..    XF(IN) =E= TFP(IN)*ACP(IN)*(DELTAP(IN)*VA(IN)**(-RHOP(IN))
                   +(1-DELTAP(IN))*NTF(IN)**(-RHOP(IN)))*(-1/RHOP(IN));

TOTACT(IN)..      X(IN) =E= XF(IN) + SUM(VV,XV(IN,VV));

VAEQ(KLA)..       VA(KLA) =E= (PROD(LA,LF(KLA,LA)**ALPHA(KLA,LA)))*
                   (KF(KLA)**ALPHA(KLA,'CAP'));

VA2EQ..           VA('TAG') =E= LF('TAG','SHF')**ALPHA('TAG','SHF');

VA3EQ..           VA('IS') =E= LF('IS','INF')**ALPHA('IS','INF');

VA4EQ..           VA('EGW') =E= LF('EGW','SKILL')**ALPHA('EGW','SKILL')*
                   LF('EGW','UNSK-U')**ALPHA('EGW','UNSK-U')*
                   KF('EGW')**ALPHA('EGW','CAP');

VA5EQ..           VA('MAG') =E= LF('MAG','SKILL')**ALPHA('MAG','SKILL')*
                   LF('MAG','UNSK-A')**ALPHA('MAG','UNSK-A')*
                   KF('MAG')**ALPHA('MAG','CAP');

PVVEQ(IN)..       PVV(IN)*VA(IN) =E= (KF(IN)*WFDIST(IN,'CAP')*WF('CAP')
                   + SUM(LA,LF(IN,LA)*WFDIST(IN,LA)*WF(LA)));

VAEQ2(IN)..       NTF(IN) =E= VA(IN)*((PVV(IN)/PNT(IN))*(1-DELTAP(IN))/
                   (DELTAP(IN))**1/(1 + RHOP(IN)));

PROFITMAX(IN,LA).. WF(LA)*WFDIST(IN,LA)*LF(IN,LA) =E= PX(IN)*
                   (1.0-STXR(IN))*ALPHA(IN,LA)*DELTAP(IN)*TFP(IN)*(ACP(IN)**
                   (-RHOP(IN)))*(XF(IN)**(1+RHOP(IN)))*(VA(IN)**(-RHOP(IN)));

DISTF(IK)..       PX(IK)*XF(IK)*(1 - STXR(IK)) + LOSS2(IK)
                   - PNT(IK)*NTF(IK)
                   - SUM(LA,WF(LA)*WFDIST(IK,LA)*LF(IK,LA))
                   - WF('CAP')*WFDIST(IK,'CAP')*KF(IK) =E= 0;

DISTFF(IFF)..     WF('CAP')*WFDIST(IFF,'CAP')*KF(IFF) =E=
                   PX(IFF)*X(IFF)*(1 - STXR(IFF) - ROYR)
                   - PNT(IFF)*NT(IFF)
                   - FFTAX - RMTAX
                   - SUM(LA,WF(LA)*WFDIST(IFF,LA)*LF(IFF,LA));

DISTC(ICOC)..     WF('CAP')*WFDIST(ICOC,'CAP')*KF(ICOC) =E=
                   PX(ICOC)*X(ICOC)*(1 - STXR(ICOC))
                   - PNT(ICOC)*NT(ICOC)
                   - SUM(LA,WF(LA)*WFDIST(ICOC,LA)*LF(ICOC,LA));

DISTV(IK,VV)..    PX(IK)*(1 - STXR(IK)) + LOSS(IK,VV)
                   - VNTCOEF(IK,VV)*PNT(IK)
                   - SUM(LA,WF(LA)*WFDISTV(IK,LA,VV)*VFCEOF(IK,LA,VV))

```

```

- WF('CAP')*WFDISTV(IK,'CAP',VV)*VFCOEF(IK,'CAP',VV) =E= 0;

VPROD(IK,VV).. VFCOEF(IK,'CAP',VV)*XV(IK,VV) =E= KV(IK,VV);

VPROD2(IK,LA,VV).. LV(IK,LA,VV) =E= VFCOEF(IK,LA,VV)*XV(IK,VV);

VPROD3(IK,VV).. NTV(IK,VV) =E= VNTCOEF(IK,VV)*XV(IK,VV);

CPROD(LA,ICOC).. LF(ICOC,LA) =E= BETACOC(LA)*X(ICOC);

CPROD2(CA,ICOC).. KF(ICOC) =E= BETACOC(CA)*X(ICOC);

FFPROD(LA) .. LF('PG',LA) =E= BETAFF(LA)*X('PG') + AFF(LA);

PUBPROD(LA).. LF('PUBS',LA) =E= BETAPUB(LA)*X('PUBS');

ARMINGTON(IM).. Q(IM) =E= AC(IM)*(DELTA(IM)*M(IM)**(-RHOC(IM))+
(1-DELTA(IM))*D(IM)**(-RHOC(IM))**(-1/RHOC(IM)));

ARMINGTON2(IMN).. Q(IMN) =E= D(IMN);

COSTMIN(IM).. M(IM) =E= D(IM)*((PD(IM)/PM(IM))*(DELTA(IM)
/(1-DELTA(IM))))** (1/(RHOC(IM)+1));

CET1(IFC).. X(IFC) =E= D(IFC) + E(IFC);

CET2(INE).. E(INE) =E= ((X(INE)**RHOT(INE)/AT(INE)**RHOT(INE))
-(1-GAMMA(INE))*D(INE)**RHOT(INE))**
(1/RHOT(INE))/GAMMA(INE)**(1/RHOT(INE));

CET3(IEN).. X(IEN) =E= D(IEN);

ESUPPLY(INE).. E(INE) =E= D(INE)*((PE(INE)/PD(INE))*(1-GAMMA(INE))
/GAMMA(INE))** (1/(RHOT(INE)-1));

PGEXPORTS.. X('PG') =E= XPG;

#### INTERMEDIATES BLOCK #####

INTEQ(I).. INT(I) =E= SUM(J,NN(I,J));

NNEQ(I,J).. NN(I,J) =E= IOF(I,J)*NT(J);

NTEQ(IN).. NT(IN) =E= NTF(IN) + SUM(VV,NTV(IN,VV));

NT2EQ(IFG).. NT(IFG) =E= SUM(I,IO(I,IFG)*X(IFG));

PNTEQ(J).. PNT(J)*NT(J) =E= SUM(I, NN(I,J)*PQ(I));

##### FACTORS BLOCK #####

YFKEQ.. YF('CAP') =E= SUM(I,WF('CAP')*WFDIST(I,'CAP')
*KF(I)) + SUM((IK,VV),WF('CAP')
*WFDISTV(IK,'CAP',VV)*KV(IK,VV));

YFLEQ(LA).. YF(LA) =E= SUM(I,WF(LA)*WFDIST(I,LA)
*LF(I,LA)) + SUM((IK,VV),WF(LA)

```

```

          *WFDISTV(IK,LA,VV)*LV(IK,LA,VV));
FKTEQ(I)..          K(I) =E= KF(I) + SUM(VV, KV(I,VV));
WFDISTVEQ(IK,LA,VV)..  WFDISTV(IK,LA,VV) =E= WFDIST(IK,LA);
CAPEQ(IK,VV)..       KSVL(IK,VV) =E= KV(IK,VV) + XKV(IK,VV);
CAP2EQ(IK)..         KF(IK) =E= KSFL(IK) - XKF(IK);
KVEQ(IK,VV)..        KV(IK,VV) =G= 0;
KFEQ(IK)..           XF(IK) =G= 0;
XKVEQ(IK,VV)..       WFDISTV(IK,'CAP',VV) =G= 0;
XKFEQ(IK)..          WFDIST(IK,'CAP') =G= 0;
FLTEQ(I,LA)..        L(I,LA) =E= LF(I,LA) + SUM(VV, LV(I,LA,VV));
*labor scenario 1 - flexible wages
*FLEQ(LA)..          FSLABOR(LA) =E= SUM(I,L(I,LA));
*UNEMEQ(LA)..        FSLABOR(LA) =E= SUM(I,L(I,LA)) + UNEM(LA);
*FL2EQ('SKILL')..   FSLABOR('SKILL') =E= FSLAB('SKILL');
*FL3EQ..             FSLABOR('UNSK-A') =E= FSLAB('UNSK-A');
*FL4EQ..             FSLABOR('SHF') =E= FSLAB('SHF');
*FL5EQ..             FSLABOR('INF') =E= FSLAB('INF');
*FL6EQ..             FSLABOR('UNSK-U') =E= FSLAB('UNSK-U');
*www
*labor scenario 2 - wage curve
*BU(LA)              = -.5;
*BU(LA)              = -.1;
*AU(LA)              = 1/((UNEM.L(LA)/FSLAB2(LA))*BU(LA));
UNEMEQ(LA)..         UNEM(LA) =E= FSLABOR(LA)*(WF(LA)/(CPI*AU(LA)))*(1/BU(LA));
FLEQ(LA)..          FSLABOR(LA) =E= SUM(I,L(I,LA)) + UNEM(LA);
FL2EQ('SKILL')..   FSLABOR('SKILL') =E= FSLAB2('SKILL');
FL3EQ..             FST =E= FSLABOR('UNSK-A') + FSLABOR('UNSK-U');
FL4EQ..             FST2 =E= FSLABOR('SHF') + FSLABOR('INF');
FL5EQ..             WF('UNSK-A') =E= WF('UNSK-U');
FL6EQ..             WF('SHF') =E= WF('INF');

```

```

##### INCOME BLOCK #####
YEQ(NINST)..          YI(NINST) =E= SUM(F, YF(F)*IYFS(NINST, F))
                        + SUM(DINST, ITRNS(NINST, DINST)*YI(DINST))
                        + ITRNL(NINST, 'ROW')*EXR;

##### SAVING AND CONSUMPTION BLOCK #####
SAVEQ(NINST)..        ISAV(NINST) =E= IMPS(NINST)*YI(NINST);

CTEQ(CNGINST)..       CT(CNGINST) =E= (YI(CNGINST)*
                        (1- SUM(INST, ITRNS(INST, CNGINST)))
                        - ISAV(CNGINST))/PCT(CNGINST);

CNEQ(IC, CINST)..     CN(IC, CINST) =E= ICONS(IC, CINST)*CT(CINST);

CDEQ(IC)..            CD(IC) =E= SUM(CINST, CN(IC, CINST));

PCTEQ(CINST)..        PCT(CINST) =E= SUM(IC, PQ(IC)*CN(IC, CINST))/CT(CINST);

##### GOVERNMENT AND TAXES BLOCK #####
GOVYEQ..              YI('GOV') =E= SSTAX
                        + TARIFF
                        + SUM(NINST, ITRNS('GOV', NINST)*YI(NINST))
                        + ITRNL('GOV', 'ROW')*EXR
                        + FFGREV;

GOVSAVEQ..            ISAV('GOV') =E= YI('GOV')
                        - PCT('GOV')*CT('GOV')
                        - SUM(INST, ITRNS(INST, 'GOV')*YI('GOV'))
                        + SFW*EXR - SFD*EXR;

STAXDEF..             SSTAX =E= SUM(INFF, STXR(INFF)*PX(INFF)*X(INFF));

TARIFFDEF..           TARIFF =E= SUM(I, TM(I)*EXR*PWM(I)*M(I));

FFTAXEQ..             FFTAX =E= .25*((PX('PG')*X('PG')*(1- STXR('PG')- ROYR))
                        - PNT('PG')*NT('PG')
                        - SUM(LA, WF(LA)*WFDIST('PG', LA)*LF('PG', LA))
                        - DEPF*PK);

RMTAXEQ..             RMTAX =E= .12*((PX('PG')*X('PG')*(1- STXR('PG')- ROYR))
                        - PNT('PG')*NT('PG')
                        - SUM(LA, WF(LA)*WFDIST('PG', LA)*LF('PG', LA))
                        - DEPF*PK - FFTAX);

FFGREVEQ..           FFGREV =E= ROYT + FFTAX + RMTAX
                        + STXR('PG')*PX('PG')*X('PG');

ROYTEQ..              ROYT =E= ROYR*PX('PG')*X('PG');

##### INVESTMENT AND INVENTORY BLOCK #####
IEQ..                 PK*IDT =E= FXDINV;

```

```

IDEQ(IVD)..          ID(IVD)  =E= KDS(IVD)*IDT;

PKTEQ..             PK*IDT   =E= SUM(IVD, PQ(IVD)*ID(IVD));

FIXEDINV..         FXDINV =E= INVEST - SUM(IST, DST(IST)*PQ(IST));

DSTEQ(IST)..       DST(IST) =E= DSTR(IST)*X(IST);

*EFFEQ..           EFF =E= CE - 1/(1 + BE*EXP(-AE*(IDTL/RGDPL)));

*EFF2EQ..          EFFG =E= CGG - 1/(1 + BGG*EXP(-AGG*(GOVSAVL/SAVINGL)));

EFFEQ..            EFF =E= 1;

EFF2EQ..           EFFG =E= 1;

##### MACRO AND TOTALS BLOCK #####

EQUIL(I)..         Q(I) =E= INT(I) + CD(I)$IC(I) + ID(I) + DST(I) ;

IMPTEQ..           IMPT =E= SUM(IM,M(IM));

EXPTEQ..           EXPT  =E= SUM(IE,E(IE));

CAEQ..             FSAV*EXR =E=  SUM(IM,M(IM)*PWM(IM)*EXR)
                        + SUM(INST,ITRNS('ROW',INST)*YI(INST))
                        - SUM(IE,E(IE)*PWE(IE)*EXR)
                        - SUM(INST,ITRNL(INST,'ROW')*EXR)
                        + SFD*EXR
                        - SFW*EXR;

TOTSAV..           SAVING =E= SUM(DINST,ISAV(DINST))+ FSAV*EXR;

*WALRAS..          SAVING =E= INVEST;

GDPY..             GDPVA =E= SUM(I,PV(I)*X(I))
                        + SSTAX
                        + TARIFF
                        + FFGREV;

GDPR..             RGDP =E=  SUM(I,CD(I) + DST(I) + ID(I))
                        + SUM(IE,E(IE))
                        - SUM(IM,(1 - TMREAL(IM))*M(IM));

##### STABILIZATION FUND #####

*sss
SFUNDEQ..          SFUND  =E= SFUNDI*(1 + RIW) + SFD - SFW;

$ontext
SFUND2EQ..         SFD*EXR =E= MAX(0,(FFGREV-1.1*GREVBM - SURPLUS));

SFUND3EQ..         SFW*EXR =E= MAX(0,(.9*GREVBM - FFGREV - SHORTFALL
                        + SURPLUS));

```

```

SFUND4EQ..          0.2*RGDP =G= SFUND*EXR;

SFUND5EQ..          (2/3)*SFUNDI =G= SFW;
$offtext
*$ontext
SFUND2EQ..          SFD          =E=  0;

SFUND3EQ..          SFW          =E=  0;

SFUND4EQ..          SURPLUS     =E=  0;

SFUND5EQ..          SHORTFALL   =E=  0;
*$offtext
*##### RESTRICTIONS

*#####*#####*FIX WORLD PRICES EXOGENOUSLY*#####*#####*#####*#####**

PWE.FX(IN)          = PWE.L(IN);
PWE.FX('PG')        = PWE.L('PG');
PWE.FX('COC')        = PWE.L('COC');
PWE.FX('PUBS')       = 0;

E.FX(IEN)           = 0.0;
E.FX(ICOC)           = E.L(ICOC);
M.FX(IMN)            = 0.0;
PE.FX(IEN)           = 0;
ID.FX(IVN)           = 0;

XV.FX(IFG,V)         = 0;
XV.FX(NK,V)          = 0;
LV.FX(IFG,LA,V)      = 0;
LV.FX(NK,LA,V)       = 0;
KV.FX(IFG,V)         = 0;
KV.FX(NK,V)          = 0;
XKV.FX(NK,V)         = 0;
LOSS.FX(NK,V)        = 0;
LOSS2.FX(NK)         = 0;
XKF.FX(NK)           = 0;
IDTSC.FX(NK)         = 0;

NTV.FX(IFG,V)        = 0;
NTV.FX(NK,V)         = 0;
NTF.FX(IFG)          = 0;

CN.FX(ICM,INST)      = 0.0;
CN.FX(IC,CNINST)     = 0;
CT.FX(CNINST)        = 0;
CD.FX(ICM)           = 0.0;
XF.FX(IFF)           = 0;
XF.FX('PUBS')        = 0;
DST.FX('COC')        = 0;
DST.FX('EGW')        = 0;
DST.FX('CT')         = 0;
DST.FX('IS')         = 0;
DST.FX('FS')         = 0;

ISAV.FX('ROW')       = 0;

```


YI.FX('ROW') = 0;
KF.FX('PUBS') = 0;
KF.FX(NK) = 0;
WFDIST.FX('PUBS','CAP') = 0;
WFDIST.FX('COC','CAP') = 1;
WFDIST.FX(NK,'CAP') = 0;
PVV.FX(IFG) = 0;
VA.FX(IFG) = 0;

pm.fx(imn) = 0;
pe.fx(ien) = 0;

*****LOWER BOUNDS FOR MCP *****

LOSS.LO(IK,V) = 0.00;
LOSS2.LO(IK) = 0;
XKV.LO(IK,V) = 0.00;
XKF.LO(IK) = 0.00;
IDTSC.LO(IK) = 0.00;
SURPLUS.LO = 0.00;
SHORTFALL.LO = 0.00;
SFD.LO = 0.00;

PX.LO(I) = 0.001;
PQ.LO(I) = 0.001;
PCT.LO(CINST) = 0.001;

PNT.LO(IN) = 0.01;

*****MACRO-CLOSURE - FIX TWO OUT OF THREE VARIABLES (EXCHANGE RATE -
PRICE INDEX - FOREIGN SAVINGS)

*EXR.FX = EXR.L;
FSAV.FX = FSAV.L;
PINDEX.FX = PINDEX.L;

*****CAPITAL MARKET CLOSURE - FIX ONE OUT OF TWO (INVESTMENT - MARGINAL
PROPENSITY TO SAVE)

*INVEST.FX = INVEST.L;
IMPS.FX(INST) = IMPS.L(INST);

*****PUBLIC SECTOR CLOSURE - FIX ONE OUT OF TWO (GOVERNMENT SAVINGS -
GOVERNMENT CONSUMPTION)

*GOVSAV.FX = GOVSAV.L;
CT.FX('GOV') = CT.L('GOV');

*****FACTOR MARKETS - FIX EITHER QUANTITIES OR PRICES*****
*****LABOR GENERALLY ALLOWED TO MOVE FROM ONE SECTOR TO ANOTHER*****

WFDIST.FX(I,LA) = WFDIST.L(I,LA);
WFDISTI.FX(I,LA) = WFDISTI.L(I,LA);
*WFDISTV.FX(IK,LA,V) = WFDISTV.L(IK,LA,V);

*****CAPITAL IS FIXED BY SECTOR*****

WFDISTI.FX(IN,'CAP') = WFDISTI.L(IN,'CAP');
WFDISTI.FX('PUBS','CAP') = WFDISTI.L('PUBS','CAP');

```
KF.FX(IFF)          = KF.L(IFF);
WF.FX('CAP')       = WF.L('CAP');
```

```
*OPTION BRATIO=1;
OPTIONS ITERLIM = 100000;
*OPTIONS LIMROW = 0, LIMCOL=0;
OPTIONS SYSOUT =OFF;
OPTIONS SOLPRINT= OFF;
OPTION MCP=PATH;
```

```
MODEL BOLCGE BASE CASE /
```

```
PMDEF.PM
PEDEF.PE
PXDEF.PX
PQDEF.PQ
PVDEF.PV
PINDEXDEF
CPIDEF.CPI
PRICFIXEQ
PPUBSEQ
```

```
ACTIVITY.XF
TOTACT.X
DISTF
DISTC
DISTFF
DISTV
VPROD.KV
VPROD2.LV
VPROD3.NTV
CPROD
CPROD2
FFPROD
PUBPROD
VAEQ
VA2EQ
VA3EQ
VA4EQ
VA5EQ
PVVEQ.PVV
VAEQ2.NTF
PROFITMAX.LF
ARMINGTON.D
ARMINGTON2
COSTMIN.M
CET1
CET2.E
CET3
ESUPPLY.PD
PGEXPORTS
```

```
INTEQ.INT
NNEQ.NN
NTEQ.NT
NT2EQ
```

PNTEQ . PNT

YFKEQ

YFLEQ

FLEQ

FL2EQ

FL3EQ

FL4EQ

FL5EQ

FL6EQ

FLTEQ . L

FKTEQ . K

WFDISTVEQ

CAPEQ

CAP2EQ

KVEQ . LOSS

KFEQ . LOSS2

XKVEQ . XKV

XKFEQ . XKF

UNEMEQ . UNEM

YEQ . YI

SAVEQ . ISAV

CTEQ . CT

CNEQ . CN

CDEQ . CD

PCTEQ . PCT

GOVYEQ

GOVSAVEQ

STAXDEF . SSTAX

TARIFFDEF . TARIFF

FFTAXEQ . FFTAX

RMTAXEQ . RMTAX

FFGREVEQ . FFGREV

ROYTEQ . ROYT

IEQ . PK

IDEQ . ID

PKTEQ . IDT

FIXEDINV . FXDINV

DSTEQ . DST

EFFEQ . EFF

EFF2EQ . EFFG

EQUIL . Q

IMPTEQ . IMPT

EXPTEQ . EXPT

CAEQ . EXR

TOTSAV . SAVING

GDPY . GDPVA

GDPR . RGDP

SFUNDEQ . SFUND

SFUND2EQ . SFD

SFUND3EQ . SFW

SFUND4EQ . SURPLUS

SFUND5EQ.SHORTFALL

/;

EXOGENOUS VARIABLES OVER TIME
#####

SET TT TIME

/0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21/

T(TT)

SIMULATION YEAR /0/

ttt(tt)

/1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16/

PARAMETERS

X7(I,TT)

PRODUCTION

XF7(IN,TT)

FLEXIBLE PRODUCTION

XV7(I,V,TT)

VINTAGE PRODUCTION

D7(I,TT)

DOMESTIC USE

Q7(I,TT)

COMMODITIES

E7(I,TT)

EXPORTS

IMPT7(TT)

IMPORTS

EXPT7(TT)

EXPORTS

LF7(I,LA,TT)

FLEXIBLE LABOR USE

LV7(IN,LA,V,TT)

VINTAGE LABOR USE

LABOR7(I,LA,TT)

SECTORAL LABOR USE

LABOR77(I,LA,TT)

GROWTH IN SECTORAL LABOR USE

FSLAB7(LA,TT)

TOTAL LABOR SUPPLY

FSLAB27(LA,TT)

TOTAL LABOR SUPPLY

UNEM7(LA,TT)

UNUSED LABOR

UNEMR7(LA,TT)

UNEMPLOYMENT RATE

KLR7(LA,TT)

CAPITAL-LABOR RATIO

KLRS7(I,LA,TT)

CAPITAL IN PRODUCTION

K7(IKF,TT)

CAPITAL IN PRODUCTION GROWTH RATE

K77(IKF,TT)

CAPITAL IN PRODUCTION GROWTH RATE

KS7(IN,TT)

CAPITAL STOCK

KT7(TT)

TOTAL CAPITAL STOCK

KT77(TT)

TOTAL CAPITAL STOCK GROWTH RATE

KF7(I,TT)

FLEXIBLE CAPITAL IN PRODUCTION

KSF7(I,TT)

FLEX. CAPITAL SUPPLY

XKF7(I,TT)

FLEX. SLACK FACTORS

KV7(I,V,TT)

VINTAGE CAPITAL IN PRODUCTION

KSV7(I,V,TT)

VINTAGE CAPITAL SUPPLY

XKV7(I,V,TT)

VINTAGE SLACK FACTORS

LOSS7(IN,V,TT)

LOSS27(IN,TT)

INT7(I,TT)

USE OF INTERMEDIATES IN PRODUCTION

NT7(I,TT)

INTERMEDIATES USE BY SECTOR

NTF7(I,TT)

INTERMEDIATE USE

NTV7(IN,V,TT)

AGGREGATE INPUT USE FOR FLEXIBLE PRODUCTION

PNT7(I,TT)

PRICE OF NT

CT7(INST,TT)	SECTORAL HOUSEHOLD CONSUMPTION
CD7(I,TT)	CONSUMPTION OF DOMESTIC AGGREGATE
CDT7(TT)	TOTAL CONSUMPTION OF DOMESTIC AGGREGATE
PCT7(INST,TT)	PRICE OF CTT
PK7(TT)	PRICE OF IDT
ID7(I,TT)	INVESTMENT DEMAND
IDT7(TT)	TOTAL INVESTMENT DEMAND
IDT77(TT)	INVESTMENT GROWTH RATE
INV7(I,TT)	INVESTMENT DESTINATION
EFF7(TT)	INVESTMENT EFFICIENCY FACTOR
EFFG7(TT)	INVESTMENT EFFICIENCY FACTOR
DST7(I,TT)	CHANGE IN STOCKS
W_LABOR7(I,LA,TT)	WAGE RATES
W_KF7(I,TT)	RETURN TO FLEXIBLE CAPITAL
W_KV7(I,V,TT)	RETURN TO VINTAGE CAPITAL
W_K7(TT)	AVERAGE RETURN TO CAPITAL
W_K_CPI7(TT)	
WF7(LA,TT)	FACTOR RETURN
WFI7(F,TT)	FACTOR RETURN
W_CPI7(LA,TT)	WAGE TO CPI RATIO
CPI7(TT)	CPI
YI_CPI7(DINST,TT)	INSTITUTIONAL INCOME TO CPI RATIO
YI_CPI77(DINST,TT)	INCOME-CPI GROWTH RATE
YF_LABOR7(LA,TT)	LABOR INCOME
YF_LABOR77(LA,TT)	LABOR INCOME GROWTH RATE
YF_CAPITAL7(TT)	CAPITAL INCOME
YF_CAPITAL77(TT)	CAPITAL INCOME GROWTH RATE
RGDP7(TT)	REAL GDP
GDPVA7(TT)	GDP VALUE ADDED
PINDEX7(TT)	PRICE INDEX
EXR7(TT)	EXCHANGE RATE
FSAV7(TT)	FOREIGN SAVINGS
PX7(I,TT)	PRODUCER PRICE
PD7(I,TT)	DOMESTIC COMMODITY PRICE
PQ7(I,TT)	AGGREGATE COMMODITY PRICE
PE7(I,TT)	DOMESTIC EXPORT PRICE
PWE7(I,TT)	WORLD EXPORT PRICE
PM7(I,TT)	DOMESTIC IMPORT PRICE
PV7(I,TT)	PRICE OF VALUE ADDED
PWEPG7(TT)	WORLD PRICE OF OIL
VALADD7(I,TT)	VALUE ADDED
VALADD77(I,TT)	VALUE ADDED GROWTH RATE
SECTORY7(I,TT)	SECTORAL INCOME
VAPCT7(I,TT)	VALUE ADDED AS A PERCENTAGE OF GDP
GOVREV7(TT)	GOVERNMENT REVENUE
GOVREVNT7(TT)	GOVERNMENT REVENUE NET OF SFD + SFW
GOVREVNT77(TT)	GOV REV NET OF SFD + SFW GROWTH
GOVREV77(TT)	GROWTH IN GOVERNMENT REVENUE
GOVCON7(TT)	GOVERNMENT CONSUMPTION
SSTAX7(TT)	SECTORAL TAXES

TARIFF7(TT)	TARIFF
ROYALTIES7(TT)	ROYALTIES
FFTAXS7(TT)	FOSSIL FUEL PROFIT TAXES
RMTAXS7(TT)	REMITTANCE TAXES FOR FOSSIL FUELS
SFUND7(TT)	STABILIZATION FUND
SFD7(TT)	STABILIZATION FUND DEPOSITS
SFW7(TT)	STABILIZATION FUND WITHDRAWALS
FFGREV7(TT)	FOSSIL FUEL GOVERNMENT REVENUES
FFGREVNT7(TT)	FOSSIL FUEL GOVERNMENT REVENUES NET OF SFD + SFW
FFGREV77(TT)	GROWTH OF FOSSIL FUEL GOVERNMENT REVENUES
FFGREVNT77(TT)	GROWTH OF FOSSIL FUEL GOVERNMENT REVENUES NET OF SFD + SFW
FFPCTGREV(TT)	FOSSIL FUEL GOV REVENUE AS A PERCENTAGE OF TOTAL GOV REVENUE
FFPCTGREVNT(TT)	FOSSIL FUEL GOV REVENUE AS A PERCENTAGE OF TOTAL GOV REVENUE NET OF SFD + SFW
GREVBM7(TT)	REVENUE BENCHMARK FOR STABILIZATION FUND
YI7(INST,TT)	INSTITUTIONAL INCOME
TRNS(INST,JNST)	TRANSERS FROM INCOME SHARES
TRNL(INST,JNST)	FIXED TRANSFERS
VA7(I,TT)	VALUE ADDED
PVV7(I,TT)	PRICE OF AGGREGATE VALUE ADDED
SAV7(TT)	TOTAL SAVINGS
INVEST7(TT)	TOTAL INVESTMENT
FXDINV7(TT)	GROSS CAPITAL INVESTMENT
GOVSAV7(TT)	GOVERNMENT SAVINGS
GOVSAVPCT(TT)	GOVERNMENT SAVINGS AS A PERCENTAGE OF TOTAL SAVINGS
ISAV7(INST,TT)	INSTITUTIONAL SAVINGS
XT7(TT)	TOTAL OUTPUT
DT7(TT)	TOTAL OUTPUT FOR DOMESTIC MARKETS
QT7(TT)	TOTAL COMMODITIES
VALADD(TT)	VALUE ADDED
X77(I,TT)	GROWTH IN PRODUCTION
XT77(TT)	GROWTH IN TOTAL PRODUCTION
RGDP77(TT)	GDP GROWTH RATE
GDPVA77(TT)	
EXR77(TT)	

;

PARAMETERS

XPGTT(TT)
 FSAVTT(TT)
 GVCNGRTT(TT)
 LSGRTT(TT)
 ISFGRTT(TT)

TABLE VARTT(*,TT) EXOGENOUS VARIABLES FOR SIMULATIONS

*QQQ

	0	1	2	3	4	5
XPGTT	2135	2200	2265	2332	2415	3730

*XPGTT	2135	2135	2135	2135	2135	2135
FSAVTT	3000	3000	3000	3000	3000	3000
GVCNGRTT	.025	.025	.025	.025	.025	.025
LSGRTT	.025	.025	.025	.025	.025	.025
ISFGRTT	.025	.025	.025	.025	.025	.025
+	6	7	8	9	10	
XPGTT	4500	5500	5500	5500	5500	
*XPGTT	2135	2135	2135	2135	2135	
FSAVTT	3000	3000	3000	3000	3000	
GVCNGRTT	.025	.025	.025	.025	.025	
LSGRTT	.025	.025	.025	.025	.025	
ISFGRTT	.025	.025	.025	.025	.025	
+	11	12	13	14	15	
XPGTT	5500	5500	5500	5500	5500	
*XPGTT	2135	2135	2135	2135	2135	
FSAVTT	3000	3000	3000	3000	3000	
GVCNGRTT	.025	.025	.025	.025	.025	
LSGRTT	.025	.025	.025	.025	.025	
ISFGRTT	.025	.025	.025	.025	.025	
+	16	17	18	19	20	
XPGTT	5500	5500	5500	5500	5500	
*XPGTT	2135	2135	2135	2135	2135	
FSAVTT	3000	3000	3000	3000	3000	
GVCNGRTT	.025	.025	.025	.025	.025	
LSGRTT	.025	.025	.025	.025	.025	
ISFGRTT	.025	.025	.025	.025	.025	

TABLE PWTT(I,TT) EXTERNAL PRICES OVER TIME

	0	1	2	3	4	5
TAG	1	1	1	1	1	1
MAG	1	1	1	1	1	1
COC	1	1	1	1	1	1
MN	1	1	1	1	1	1
CONG	1	1	1	1	1	1
INTG	1	1	1	1	1	1
CAPG	1	1	1	1	1	1
EGW	1	1	1	1	1	1
FS	1	1	1	1	1	1
+	6	7	8	9	10	
TAG	1	1	1	1	1	
MAG	1	1	1	1	1	
COC	1	1	1	1	1	
MN	1	1	1	1	1	
CONG	1	1	1	1	1	
INTG	1	1	1	1	1	
CAPG	1	1	1	1	1	
EGW	1	1	1	1	1	
FS	1	1	1	1	1	

+	11	12	13	14	15
TAG	1	1	1	1	1
MAG	1	1	1	1	1
COC	1	1	1	1	1
MN	1	1	1	1	1
CONG	1	1	1	1	1
INTG	1	1	1	1	1
CAPG	1	1	1	1	1
EGW	1	1	1	1	1
FS	1	1	1	1	1
+	16	17	18	19	20
TAG	1	1	1	1	1
MAG	1	1	1	1	1
COC	1	1	1	1	1
MN	1	1	1	1	1
CONG	1	1	1	1	1
INTG	1	1	1	1	1
CAPG	1	1	1	1	1
EGW	1	1	1	1	1
FS	1	1	1	1	1
i					

TABLE PWPTT(I,TT) EXTERNAL PRICES OVER TIME

*PPP

	0	1	2	3	4	5	6
PG	1	1	1	1	1	1	1
*PG	1	1	1	1	1	.75	.75
*PG	1	1	2	2	2	2	2
+	7	8	9	10	11		
PG	1	1	1	1	1		
*PG	2	2	2	2	2		
*PG	.5	.5	.5	.5	.5		
*PG	1.5	1.5	1.5	1.5	1.5		
*PG	0.8	1.2	0.8	1.2	0.8		
*PG	0.8	0.8	1.2	1.2	0.8		
+	12	13	14	15	16		
PG	1	1	1	1	1		
*PG	2	2	2	2	2		
*PG	.75	1	1	1	1		
*PG	.5	.5	.5	.5	.5		
*PG	.5	.5	.75	1	.5		
*PG	1.5	1.5	1.5	1.5	1.5		
*PG	1.2	0.8	1.2	0.8	1.2		
*PG	0.8	1.2	1.2	0.8	0.8		
+	17	18	19	20	21		
PG	1	1	1	1	1		
*PG	.5	.5	.5	.5	.5		
*PG	1.5	1.5	1.5	1.5	1.5		


```
*PG          0.8    1.2    0.8    1.2    0.8
;
```

```
PARAMETER
TFPGR(I);
```

```
PARAMETER TFPGR1(I) TOTAL FACTOR PRODUCTIVITY GROWTH RATE
```

```
/TAG          0.01
MAG           0.01
COC           0.01
PG            0.01
MN            0.01
CONG         0.01
INTG         0.01
CAPG         0.01
EGW          0.01
CT           0.01
IS           0.01
FS           0.01
PUBS        0.01
/;
```

```
PARAMETER TFPGR2(I) TOTAL FACTOR PRODUCTIVITY GROWTH RATE
```

```
/TAG          0.0
MAG           0.0
COC           0.0
PG            0.0
MN            0.0
CONG         0.0
INTG         0.0
CAPG         0.0
EGW          0.0
CT           0.0
IS           0.0
FS           0.0
PUBS        0.0
/;
```

```
;
```

```
*TTT
```

```
TFPGR(I)      = TFPGR1(I);
```

```
***TURN OFF THE EQUATION BELOW TO READ FROM UPPER TABLE
```

```
TFPGR(I)      = TFPGR2(I);
```

```
XPGTT(TT)     = VARTT('XPGTT',TT);
```

```
FSAVTT(TT)    = VARTT('FSAVTT',TT);
```

```
GVCNGRTT(TT) = VARTT('GVCNGRTT',TT);
```

```
LSGRTT(TT)    = VARTT('LSGRTT',TT);
```

```
ISFGRTT(TT)   = VARTT('ISFGRTT',TT);
```

```
BOLCGE.SCALEOPT = 1;
```

```
SOLVE BOLCGE USING MCP;
```

```
X7(I,T)       = X.L(I);
```

```
XF7(IN,T)     = XF.L(IN);
```

```

XV7(IN,V,T)      = XV.L(IN,V);          XT7(T)      = SUM(I,X7(I,T));
D7(I,T)         = D.L(I);             DT7(T)      = SUM(I,D7(I,T));
Q7(I,T)         = Q.L(I);             QT7(T)      = SUM(I,Q7(I,T));
E7(I,T)         = E.L(I);             IMPT7(T)    = IMPT.L;
EXPT7(T)        = EXPT.L;             CPI7(T)     = CPI.L;   W_CPI7(LA,T) =
WF.L(LA)/CPI7(T);

LF7(I,LA,T)     = LF.L(I,LA);         LV7(IN,LA,V,T) = LV.L(IN,LA,V);
LABOR7(I,LA,T)  = L.L(I,LA);         UNEM7(LA,T)   = UNEM.L(LA);
FSLAB7(LA,T)    = FSLAB(LA);         FSLAB27(LA,T) = FSLABOR.L(LA);

KF7(I,T)        = KF.L(I);           KSF7(IN,T)   = KSFL(IN);
XKF7(IN,T)      = XKF.L(IN);
KV7(I,VV,T)     = KV.L(I,VV);        KSV7(I,VV,T) = KSVL(I,VV);
XKV7(IN,VV,T)   = XKV.L(IN,VV);     LOSS7(IN,VV,T) = LOSS.L(IN,VV);
LOSS27(IN,T)    = LOSS2.L(IN);
K7(IKF,T)       = K.L(IKF);
KS7(IN,T)       = KSFL(IN) + SUM(V,KSVL(IN,V));
KT7(T)          = SUM(IKF,K7(IKF,T)); KLR7(LA,T)   = KT7(T)/FSLAB7(LA,T);

WF7(LA,T)       = WF.L(LA);           WFI7(F,T)    = WFI.L(F);
W_LABOR7(I,LA,T) = WF.L(LA)*WFDIST.L(I,LA);
W_KF7(I,T)      = WF.L('CAP')*WFDIST.L(I,'CAP');
W_KV7(IK,VV,T)  = WF.L('CAP')*WFDISTV.L(IK,'CAP',VV);
W_K7(T)         = (SUM(I,WF.L('CAP')*WFDIST.L(I,'CAP')*KF.L(I)) +
SUM((VV,IK),WF.L('CAP')*WFDISTV.L(IK,'CAP',VV)*KV.L(IK,VV)))/KT7(T);
W_K_CPI7(T)     = W_K7(T)/CPI7(T);

YF_LABOR7(LA,T) = SUM(I,WF.L(LA)*WFDIST.L(I,LA)*LF.L(I,LA))
+ SUM((IK,VV),WF.L(LA)*WFDISTV.L(IK,LA,VV)*LV.L(IK,LA,VV));
YF_CAPITAL7(T)  = SUM(I,WF.L('CAP')*WFDIST.L(I,'CAP')*KF.L(I))
+ SUM((IK,VV),WF.L('CAP')*WFDISTV.L(IK,'CAP',VV)*KV.L(IK,VV));

INT7(I,T)       = INT.L(I);
NT7(I,T)        = NT.L(I);
NTF7(I,T)       = NTF.L(I);
NTV7(IN,VV,T)   = NTV.L(IN,VV);
PNT7(I,T)       = PNT.L(I);

CT7(INST,T)     = CT.L(INST);
CD7(I,T)        = CD.L(I);
CDT7(T)         = SUM(I,CD.L(I));
PCT7(INST,T)    = PCT.L(INST);

PK7(T)          = PK.L;
ID7(I,T)        = ID.L(I);
IDT7(T)         = IDT.L;
INV7(IN,T)      = IDTSC.L(IN);
EFF7(T)         = EFF.L;
EFFG7(T)        = EFFG.L;
DST7(I,T)       = DST.L(I);

RGDP7(T)        = RGDP.L;
GDPVA7(T)       = GDPVA.L;
PINDEX7(T)      = PINDEX.L;
EXR7(T)         = EXR.L;
FSAV7(T)        = FSAV.L;

```

```

PX7(I,T)           = PX.L(I);
PD7(I,T)           = PD.L(I);
PQ7(I,T)           = PQ.L(I);
PE7(I,T)           = PE.L(I);
PWE7(I,T)          = PWE.L(I); PWE7(T) = PWE.L('PG');
PM7(I,T)           = PM.L(I);
PV7(I,T)           = PV.L(I);

VALADD7(I,T)       = (PV.L(I)+((STXR(I)+ROYR$IFF(I))*PX.L(I)))*X.L(I)
                    + FFTAX.L$IFF(I) + RMTAX.L$IFF(I)
                    + TM(I)*PWM(I)*M.L(I);

SECTORY7(I,T)      = PV.L(I)*X.L(I);

GOVREV7(T)         = YI.L('GOV');
GOVCON7(T)         = ISAV.L('GOV');
SSTAX7(T)          = SSTAX.L;
TARIFF7(T)         = TARIFF.L;
ROYALTIES7(T)      = ROYT.L;
FFTAXS7(T)         = FFTAX.L;
RMTAXS7(T)         = RMTAX.L;
SFUND7(T)          = SFUND.L;
SFD7(T)            = SFD.L;
SFW7(T)            = SFW.L; FFGREV7(T) = FFGREV.L;
FFGREVNT7(T)       = FFGREV.L - SFD.L + SFW.L; GREVBM7(T) = GREVBM;

YI7(INST,T)        = YI.L(INST); YI_CPI7(DINST,T) = YI.L(DINST)/PCT.L(DINST);
TRNS(INST,JNST)    = ITRNS(INST,JNST)*YI.L(JNST);
TRNL(INST,JNST)    = ITRNL(INST,JNST);

VA7(I,T)           = VA.L(I);           PVV7(I,T)           = PVV.L(I);

SAV7(T)            = SAVING.L;          INVEST7(T)           = INVEST.L;
FXDINV7(T)         = FXDINV.L;
ISAV7(DINST,T)     = ISAV.L(DINST); gov7sav(t) = isav.l('gov');
VALADDT(T)         = SUM(I,VALADD7(I,T));
VAPCT7(I,T)        = VALADD7(I,T)/VALADDT(T);

```

INVESTMENT ALLOCATION MODULE

* THIS MODULE USES PRICES FROM THE PREVIOUS RUN TO
* ASSIGN THE DESTINATION OF INVESTMENT.
* IN EFFECT, PRODUCERS ASSUME THAT CURRENT PRICES
* REFLECT WHAT FUTURE PRICES WILL BE.
* INVESTMENT IS THUS LOCKED INTO EACH SECTOR, AND BROUGHT
* INTO PRODUCTION IN THE NEXT TIME PERIOD.

```

PARAMETER
KSHARE(IK)  MARGINAL PRODUCT OF CAPITAL
;
EQUATIONS
CAPII2EQ(IK)
KSFIIEQ(IK)
INVIIEQ
MPKEQ(IK)
;

```

*III

CAP112EQ(IK).. KF(IK) + XKF(IK) =G= KSFL(IK);
KSF11EQ(IK).. KSFL(IK)+ IDTSC(IK) =G= KF(IK);
INV11EQ.. IDTL =E= SUM((IK),IDTSC(IK));
MPKEQ(IK).. WFI('CAP')*KF(IK) =E= KSHARE(IK);

MODEL INVCGE BASE CASE /
CAP112EQ.XKF
KSF11EQ.IDTSC
MPKEQ.KF
INV11EQ/
;

*\$ONTEXT

** ##### PERIOD 1 #####
*VC('0') = NO;
*VC('1') = YES;
*SET TO '1' EARLIER

KSHARE(IK) = PX.L(IK)
*(1.0-STXR(IK))*ALPHA(IK,'CAP')*DELTAP(IK)*TFP(IK)*(ACP(IK)**
(-RHOP(IK)))*(XF.L(IK)**(1+RHOP(IK)))*(VA.L(IK)**(-RHOP(IK)));

IDTL = IDT.L;
RGDPL = RGDP.L;
GOVSAVL = ISAV.L('GOV');
SAVINGL = SAVING.L;
XFL(IK) = XF.L(IK);
VF11COEF(IK,'CAP',VC)\$XFL(IK) = KF.L(IK)/XF.L(IK);
VF11COEF(IK,LA,VC)\$XFL(IK) = LF.L(IK,LA)/XF.L(IK);
VNT11COEF(IK,VC)\$XFL(IK) = NTF.L(IK)/XF.L(IK);
IDTSC.L(IN) = 0;

INVCGE.SCALEOPT = 1;

IDTL = IDT.L - (FFGREV.L - SFD.L + SFW.L)*WFACTOR;

*\$ONTEXT

SOLVE INVCGE USING MCP;
*DISPLAY XF.L, KF.L, XKF.L, WFI.L, IDTSC.L, KSHARE;

T('0') = NO;
T('1') = YES;

*THIS IS WHERE THE OMEGA PARAMETER IS SET

OMEGA = .5;
*OMEGA = 0;

FST = FST*(1 + LSGRTT('1'));
FST2 = FST2*(1 + LSGRTT('1'));
FSLAB(LA) = FSLAB(LA)*(1 + LSGRTT('1'));
FSLAB2(LA) = FSLAB2(LA)*(1 + LSGRTT('1'));
KSVL(IK,V) = KSVL(IK,V)*(1- DEP);

```

KSVL(IK,VC)      = OMEGA*(1 - DEP)*KSFL(IK);
KSFL(IK)         = (1- OMEGA)*(1 - DEP)*KSFL(IK) + IDTSC.L(IK);
TFP(IN)          = TFP(IN)*(1+TFPGR(IN));

KV.L(IK,V)       = KSVL(IK,V);
XV.L(IK,V)       = KV.L(IK,V)/VFCEOF(IK,'CAP',V);
NTV.L(IK,V)      = XV.L(IK,V)*VNTCOEF(IK,V);
LV.L(IK,LA,V)    = VFCEOF(IK,LA,V)*XV.L(IK,V);

WFDISTV.L(IK,'CAP',VV) = (PX.L(IK)*(1 - STXR(IK))
                        - VNTCOEF(IK,VV)*PNT.L(IK)
                        - SUM(LA, WF.L(LA)*WFDISTV.L(IK,LA,VV)*VFCEOF(IK,LA,VV)))/
                        WF.L('CAP')*VFCEOF(IK,'CAP',VV);

```

```
DISPLAY WFDISTV.L;
```

```

SFUNDI           = SFUND.L;
XPG              = XPGTT('1');
FSAV.FX         = FSAVTT('1');
CT.FX('GOV')    = CT.L('GOV')*(1 + GVCNGRTT('1'));
PWE.FX('PG')     = PWPTT('PG','1');

```

```
SOLVE BOLCGE USING MCP;
```

```

DISPLAY RGDP.L,X.L,E.L,D.L,PX.L,PD.L,PE.L,EXR.L,PINDEX.L;
display WF.L,WFI.L,XKV.L,XKF.L,KSFL, KSFL,
XV.L,LV.L,KSVL,KSVL,KV.L,WFDIST.L,WFDISTV.L,WFDISTI.L;
DISPLAY LOSS.L;

```

```

X7(I,T)          = X.L(I);
XF7(IN,T)        = XF.L(IN);
XV7(IN,V,T)      = XV.L(IN,V);
XT7(T)           = SUM(I,X7(I,T));
D7(I,T)          = D.L(I);
DT7(T)           = SUM(I,D7(I,T));
Q7(I,T)          = Q.L(I);
QT7(T)           = SUM(I,Q7(I,T));
E7(I,T)          = E.L(I);
IMPT7(T)         = IMPT.L;
EXPT7(T)         = EXPT.L;
CPI7(T)          = CPI.L;
W_CPI7(LA,T)     = WF.L(LA)/CPI7(T);

```

```

LF7(I,LA,T)      = LF.L(I,LA);
LV7(IN,LA,V,T)   = LV.L(IN,LA,V);
LABOR7(I,LA,T)   = L.L(I,LA);
UNEM7(LA,T)      = UNEM.L(LA);
FSLAB7(LA,T)     = FSLAB(LA);
FSLAB27(LA,T)    = FSLABOR.L(LA);

```

```

KF7(I,T)         = KF.L(I);
KSF7(IN,T)       = KSFL(IN);
XKF7(IN,T)       = XKF.L(IN);
KV7(I,VV,T)      = KV.L(I,VV);
KSV7(I,VV,T)     = KSVL(I,VV);
XKV7(IN,VV,T)    = XKV.L(IN,VV);

```

LOSS7(IN,VV,T) = LOSS.L(IN,VV);
LOSS27(IN,T) = LOSS2.L(IN);
K7(IKF,T) = K.L(IKF);
KS7(IN,T) = KSFL(IN) + SUM(V,KSVL(IN,V));
KT7(T) = SUM(IKF,K7(IKF,T));

WF7(LA,T) = WF.L(LA);
WFI7(F,T) = WFI.L(F);
W_LABOR7(I,LA,T) = WF.L(LA)*WFDIST.L(I,LA);
W_KF7(I,T) = WF.L('CAP')*WFDIST.L(I,'CAP');
W_KV7(IK,VV,T) = WF.L('CAP')*WFDISTV.L(IK,'CAP',VV);
W_K7(T) = (SUM(I,WF.L('CAP')*WFDIST.L(I,'CAP')*KF.L(I))
+ SUM((VV,IK),WF.L('CAP')*WFDISTV.L(IK,'CAP',VV)*KV.L(IK,VV)))/KT7(T);
W_K_CPI7(T) = W_K7(T)/CPI7(T);

YF_LABOR7(LA,T) = SUM(I,WF.L(LA)*WFDIST.L(I,LA)*LF.L(I,LA))
+ SUM((IK,VV),WF.L(LA)*WFDISTV.L(IK,LA,VV)*LV.L(IK,LA,VV));
YF_CAPITAL7(T) = SUM(I,WF.L('CAP')*WFDIST.L(I,'CAP')*KF.L(I))
+ SUM((IK,VV),WF.L('CAP')*WFDISTV.L(IK,'CAP',VV)*KV.L(IK,VV));

INT7(I,T) = INT.L(I);
NT7(I,T) = NT.L(I);
NTF7(I,T) = NTF.L(I);
NTV7(IN,VV,T) = NTV.L(IN,VV);
PNT7(I,T) = PNT.L(I);

CT7(INST,T) = CT.L(INST);
CD7(I,T) = CD.L(I);
CDT7(T) = SUM(I,CD.L(I));
PCT7(INST,T) = PCT.L(INST);

PK7(T) = PK.L;
ID7(I,T) = ID.L(I);
IDT7(T) = IDT.L;
INV7(IN,T) = IDTSC.L(IN);
EFF7(T) = EFF.L;
EFFG7(T) = EFFG.L;
DST7(I,T) = DST.L(I);

RGDP7(T) = RGDP.L;
GDPVA7(T) = GDPVA.L;
PINDEX7(T) = PINDEX.L;
EXR7(T) = EXR.L;
FSAV7(T) = FSAV.L;

PX7(I,T) = PX.L(I);
PD7(I,T) = PD.L(I);
PQ7(I,T) = PQ.L(I);
PE7(I,T) = PE.L(I);
PWE7(I,T) = PWE.L(I); PWE7(T) = PWE.L('PG');
PM7(I,T) = PM.L(I);
PV7(I,T) = PV.L(I);

VALADD7(I,T) = (PV.L(I)+((STXR(I)+ROYR\$IFF(I))*PX.L(I)))*X.L(I)
+ FFTAX.L\$IFF(I) + RMTAX.L\$IFF(I)
+ TM(I)*PWM(I)*M.L(I);

SECTORY7(I,T) = PV.L(I)*X.L(I);

```

GOVREV7(T)      = YI.L('GOV');
GOVCON7(T)      = ISAV.L('GOV');
SSTAX7(T)       = SSTAX.L;
TARIFF7(T)      = TARIFF.L;
ROYALTIES7(T)   = ROYT.L;
FFTAXS7(T)      = FFTAX.L;
RMTAXS7(T)      = RMTAX.L;
SFUND7(T)       = SFUND.L;
SFD7(T)         = SFD.L;
SFW7(T)         = SFW.L; FFGREV7(T) = FFGREV.L;
FFGREVNT7(T)    = FFGREV.L - SFD.L + SFW.L; GREVBM7(T) = GREVBM;

YI7(INST,T)     = YI.L(INST); YI_CPI7(DINST,T) = YI.L(DINST)/PCT.L(DINST);
TRNS(INST,JNST) = ITRNS(INST,JNST)*YI.L(JNST);
TRNL(INST,JNST) = ITRNL(INST,JNST);

VA7(I,T)        = VA.L(I);
PVV7(I,T)       = PVV.L(I);

SAV7(T)         = SAVING.L;
INVEST7(T)      = INVEST.L;
FXDINV7(T)      = FXDINV.L;
ISAV7(DINST,T) = ISAV.L(DINST); govsav7(t) = isav.l('gov');
VALADD7(T)      = SUM(I,VALADD7(I,T));
VAPCT7(I,T)     = VALADD7(I,T)/VALADD7(T);

** ##### PERIOD 2 #####
VC('1') = NO;
VC('2') = YES;

```

and so on for 15 periods