sets

a SECTORS

/

agric Agriculture and Animal husbandry

othm Crude oil and natural gas and other mines

food Food

texti Textiles

furni Processing of timber Manufacture of furniture paper

petr Coke production and oil refining and nuclear fuel

chemical Manufacture of chemicals and chemical products

nmetal Non-metallic industries

metal Metal industries except machinery and equipment

machi Manufacture of machinery & equipment and furniture

power Power

gas Natural gas distribution

water Water

const Construction

trans Transportation

service

/

Alias(a,c);

sets

ean(a) non-Energy sectors

/

agric

othm

food

texti

furni

chemical

nmetal

metal

machi

water

const

trans

service

/

alias(ean,ecn);

sets

ea(a) Energy fossil sectors

/petr,gas,power/

ec energy Carrier

/petrol,kerosene,coil,gasoline,gas,lpg,pow/

n pollutants

/

co

co2

nox

so2

/

f factors of production

/l,k/

ins institutes

/h,en,go,wo/

insd domestic instituions

/h,en,go/

insdng non-goverment domestic instituions

/h,en/

cm(c) Import

/

agric

othm

food

texti

furni

petr

chemical

nmetal

metal

machi

trans

service

/

CE(c) Export

/

agric

othm

food

texti

furni

petr

chemical

nmetal

metal

machi

power

gas

water

trans

service

/

CX(c) Domestic goods

/

agric

othm

food

texti

furni

petr

chemical

nmetal

metal

machi

power

gas

water

const

trans

service

/

CT(c)

/

agric

othm

food

texti

furni

petr

chemical

nmetal

metal

machi

trans

service

/

Cen(c) nonExport

/const/

;

\*\*\*\*\*\*\*\*\*\*\*2.Parameter Definition ----------------------------------------------

\*\*\*\*\*\*\*2.1 Base year variable Definition----------------------------------------

parameter

QEEE0(a) Energy factor input of fossil (petr-gas) in base year

Epetr0(a) Energy factor input of petr in base year

Egas0(a) Energy factor input of gas in base year

QED0(a) Energy composite factor input in base year

QELE0(a) Energy factor input of power in base year

QINT0(a) Capital-Labor-Intermediate composite factor input in base year

KL0(a) Capital-Labor composite factor input in base year

QLD0(a) Labor factor input in base year

QKD0(a) Capital factor input in base year

ND0(a) Intermediate input of the i-th sector in base year

UND0(ean,a) Unit intermediate input in base year

QA0(a) Output of the i-th sector in base year

WL0 Relatively Price of the Labor factor in base year

PL0(a)

wldist(a)

WK0 Relatively Price of the Capital factor in base year

PK0(a)

wrdist(a)

WE0(a) Price of the Energy composite factor in base year

PQEEE0(a) Price of the fossil (petr-gas) composite factor in base year

Pgas0(a) Price of the gas composite factor in base year

Ppetr0(a) Price of the petr composite factor in base year

PELE0(a) Price of the power composite factor in base year

PA0(a) Price of the i-th sector in base year

PQINT0(a) Price of the Capital-Labor-intermediate composite factor in base year

PND0(a) Price of the intermediate input the i-th sector in base year

PKL0(a) Price of the Capital-Labor composite factor in base year

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

QQ0(c) Armington's composite good in base year

QDC0(c) Armington's domestic good CET's domestic good in base year

QM0(c) Imports good in base year

QEC0(c) Exports good in base year

PQ0(c) Armington's composite good price in base year

PDC0(c) The j-th domestic good price in base year

PM0(c) Import price in local currency in base year

PEC0(c) Export price in local currency in base year

EXR0 Exchange rate in base year

PWM0(c) Import international price in base year

PWE0(c) Export international price in base year

QX0(c)

PX0(c)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

YI0(c) the income of household labor from the i-th sector in base year

TYL0 the total income of household from labor in base year

YHK0 the total income of household from capital in base year

YHW0 the total income of household from foreign in base year

YHT0 the total income of household in base year

SH0 the saving of household in base year

QH0(c) the consumption of household to the i-th good in base year

transfrhent0 the transfer payments of the enterprise to household in base year

FTW0 the transfer payments of household to otherworld in base year

EH0 Household consumption expenditure

LHD0(c) At least household consumption demand from j-th good

LHDz sum LHD0(c)

transfrrh0 the transfer payments of the otherworld to household in base year

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

YK0(a) the income of capital from the i-th sector in base year

TYK0 the total income from capital in base year

YWK0 the income of foreign from capital in base year

YEK0 the income of enterprise capital in base year

ENTSAV0 the saving of enterprise in base year

INV0(a) the investing of the j-th good in base year

STO0(a)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

ATAX0(c) the income of government from the i-th sector indirect tax in base year

MTAX0(c) the income of government from the i-th good tariff tax in base year

HTAX0 the income of government from household income tax in base year

ENTAX0 the income of government from enterprise income tax in base year

transfrrg0 the income of government from foreign in base year

ETAX0(c) the income of government from export tax in base year

YG0 the total income of government in base year

transfrhg0 the transfer payments of government to household in base year

transfrgent0 the transfer payments of government to enterprise in base year

transfrhr0 the payments of government to foreign in base year

GSAV0 the saving of government in base year

GD0(c) the consumption of government to the j-th good in base year

EG0 the government expenses in base year

CTAX0 the income of government from environmental tax on activity

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Environmental\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

tCO2

tCO

tSO2

tNOx

EINT(ec,a)

thete(ec)

emiss(ec,n)

\*emissco2(ec)

\*emissco(ec)

\*emissso2(ec)

\*emissnox(ec)

QHH0(ec)

tax(n)

\*taxHCO2

\*taxHCO

\*taxHSO2

\*taxHNOx

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FSAV0 the saving of foreign in base year

EINV0 the total investing in base year

INV0(a) the investment

TSAV0 the total saving in base year

QLS0 total Labor supply in base year

QKS0 total Capital supply in base year

RGDP0 the real GDP in base year

SGDP0(a) the nominal GDP of the i-th sector in base year

GDP0 the nominal GDP in base year in base year

PGDP0 the GDP price index in base year

WALRAS0 the walras in base year

VBIS

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*2.2 Elasticity Parameters Definition ----------------------------------

rhoQX(a) Elasticity of substitution in the QINT input and energy composite input(QED)

rhoQINT(a) Elasticity of substitution in the captial-labor(KL) and intermediate input(ND)

rhoKL(a) Elasticity of substitution in the captial(QKD) and labor input(QLD)

rhoE(a) Elasticity of substitution in the fossil(QEEE) and power input(QELE)

rhoQEEE(a) Elasticity of substitution in the fossil (Epetr and Egas) input

parQX(a)

parQINT(a)

parKL(a)

parE(a)

parQEEE(a)

rhoQQ(c) Elasticity parameter in the Arminton function

rhoCET(c) Elasticity parameter in the CET function

parQQ(c) The parameter about the Arminton function elasticity parameter

parCET(c) The parameter about the CET function elasticity parameter

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*2.3 Share Parameter Definition ----------------------------------------

deltaQINT(a) KLND Share parameter in production function

deltaE(a) E Share parameter in production function

scaleQX(a)

deltaKL(a) KL Share parameter in production function

deltaND(a) ND Share parameter in production function

scaleQINT(a)

deltaL(a) L Share parameter in production function

deltaK(a) K Share parameter in production function

scaleKL(a)

deltaQEEE(a) fossil(petr-gas) energy share parameter in production function

deltaQELE(a) power energy share parameter in production function

scaleE(a)

deltaEpetr(a) petr composite energy share parameter in production function

deltaEgas(a) gas composite energy share parameter in production function

scaleQEEE(a)

scaleQQ(c) Scale parameter in the Armington function

deltaQM(c) QM Share parameter in the Armington function

deltaQDC(c) QD Share parameter in the Armington function

deltaQDCC(c) QD Share parameter in the CET function

scaleCET(c) Scale parameter in the CET function

deltaQEC(c) QE Share parameter in the CET function

deltaQDC(c) QDs Share parameter in the CET function

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*2.4 Other Parameter Definitions ---------------------------------------

ca(ean,a) intermediate input parameters

ta the rate product tax

te(c) the rate of export of the j-th good

\*\*\*\*\*

tqj the rate of sale

\*\*\*\*\*

tm(c) the rate of import tariff of the j-th good

tih the rate household income tax

tient the rate enterprise income tax

ta(a) the rate of production tax to the i-th sector

ratehk the rate of household capital income in total capital income

ratehw the rate of household income from foreign

savh the rate of household's savings

ratewk the rate of foreign capital income in total capital income

ratehe the rate of enterprise to household in enterprise total capital

invest(c) the rate of investing to the j-th good

stoinv(a) the rate of stocks of the i-th sector

ratefw the rate of foreign world income from household

rategw the rate of Government income from foreign

ratehg the rate of government to household in total government income

ratewg the rate of government to foreign in total government income

rateeg the rate of government to enterprise in total government income

savg the rate of government's savings

cong(c) the rate of government consumption to j-th good

THD0 the total demand of household

hdye(a) the household demand elasticity parameters of income

frisch frisch parameter

hds(a) the consumption share of household

mpci(a) intial marginal propensity to consume

tmcpi the total intial marginal propensity to consume

mpc(a) the adjustment marginal propensity to consume

;

\*\*\*\*\*\*\*\*\*\*\*3 Variable and Parameters initialization-----------------------------

TABLE UND0(ean,a) Intermediate input dates in base year

 agric othm food texti furni petr chemical nmetal metal machi power gas water const trans service

agric 155805687 2081074 265806067 8467702 1834757 656421 2257900 1927880 268039 432018 6437 18484 50229 1138742 104160 12245816

othm 405980 179942 86803 11212 28569 80924840 499253 5994923 24821339 1698141 622 237855 8979 6402002 9228 695501

food 40270459 549749 31440130 756494 309780 2083479 5090704.095 1372509 3052825 4398791 11320 17357 119533 298929 248827 32425069

texti 1751807 189135 943937 17805677 130019 825839 814886 4066035 1161381 3274396 3654 11883 42400 1006568 139826 3288377

furni 1311003 102908 1507917 118926 4805336 766842 2733614 1408911 935915 5132824 8671 6965 39394 5067353 58491 5658739

chemical 25846849 4522124 1500590 7672970 2098171 107617043 103492302.7 25748214 7528547 22325749 35458 83206 288789 7598663 972938 21225687

nmetal 4693793 659524 4318496 1277658 333983 5132002 13379489 9100874 7305753 19894406 21780 63643 229450 84742196 10343683 18343815

metal 2274027 953994 2087048 606554 855005 12643079 5160666 6061286 132589184 87408364 169930 37140 98347 113048365 482898 9939434

machi 3149718 1259553 577989 432037 1221460 3356774 2795785 2163954 7460516 159592361 24281 125285 162563 20349204 2247589 28573015

water 6190920 660004 390038 67745 33830 114160 1478983 367225 373174 157438 24134 6701 2332773 587223 39107 4024188

const 1171278 1688237 220261 44347 96166 1594042 1167417 719286 794621 493998 44548 4620 515527 43334507 562635 61667385

trans 20877020 3169291 12444231 1413297 1399972 22691978 8033381 16176012 26249764 15784898 43638 90559 210599 55159648 7238710 42959356

service 52409077 20209854 38362930 8775647 6429099 90819097 41194285 28101992 60948595 101339888 6726886 1125259 2053640 105857512 32065395 236638961

;

ND0(a)= sum(ean,UND0(ean,a));

TABLE secda2(a,\*) Sectors dates in base year

 QDC QEC QM ATAX MTAX QH GD YI QLD QKD YK STO INV SGDP PX TFP0 hdye QX ETAX

agric 876019410 67087976 76356394 -1808036 6659629 277923703 6933807 16295580 20546874 47382525 60752824 138060488 47382525 943107386 1 1 0.5 943107386 0

othm 76886712 1019411088 3229364 7444947 105574 793045 0 28310224 242279 63598426 965641612 -45911520 63598426 1096297800 1 1 0.5 1096297800 0

food 594344111 43199494 157808582 10666114 4890033 415774660 0 26192074 500152 10314056 56628047 56123495 10314056 637543605 1 1 0.5 637543605 0

texti 136145485 28086638 84456222 3556924 2950205 120836374 0 9700655 185240 3639392 6921627 -20146710 3639392 164232123 1 1 0.5 164232123 0

furni 71457240 635416 39361275 2576411 2354492 8889758 0 3166000 60457 2637124 3513930 32903671 2637124 72092656 1 1 0.5 72092656 0

petr 378614200 234811048 57192354 2434966 500305 129870789 0 5229980 99869 12715777 199766322 -124289059 12715777 613425248 1 1 0.5 613425248 0

chemical 380755598 169323499 153250179.2 6049945.994 5294476 65616094 0 18743228.95 357912 12421968 96984593.48 -23417796 12421968 550079097 1 1 0.5 550079097 0

nmetal 217822816 39675116 38835297 6680375 5055583 20574477 0 22890924 437115 13934648 55087529 17407794 13934648 257497932 1 1 0.5 257497932 0

metal 532150004 53617101 152543449 12862241 8987673 12020837 0 30451469 581488 19956001 80304128 145713848 19956001 585767105 1 1 0.5 585767105 0

machi 1087282901 40094846 489027014 44704110 38267423 175497219 0 44005064 840301 8283775 90325927 678293599 8283775 1127377747 1 1 0.5 1127377747 0

power 106974889.8 14981443.54 0 878429.1026 0 29657351 0 18061197.39 40339 43422701 72002714.19 -18998729.87 43422701 121956333.3 1 1 0.5 121956333.3 0

gas 269440940 78325376 0 2341272.5 0 80066617 0 90763415.77 202716 9435660 221402216.9 944860.2499 9435660 347766316 1 1 0.5 347766316 0

water 28132212.51 1274.38565 0 217846.9938 0 19227953 0 9158436.826 20455 56273342 6420588.806 -7943386.188 56273342 28133486.9 1 1 0.5 28133486.9 0

const 821184482 0 0 6732687 0 10670860 5330 119735295 3112017 41864059 183401806 696389417 41864059 821184482 1 1 0.5 821184482 0

trans 474870855 60585652 52460025 3608640 0 161034104 0 49843842 1833745 116187746 88816296 79894397 115787190 535456507 1 1 0.5 535456507 0

service 3536700140 56987280 107867520 20276690 0 1430941754 674782342 715937305 2290855586 623558033 1217587894 597917927 623958589 3593687420 1 1 0.5 3593687420 0

;

QDC0(a)=secda2(a,"QDC");

QEC0(a)=secda2(a,"QEC");

QX0(a)=secda2(a,"QX");

QA0(a)=secda2(a,"QX");

QM0(a)=secda2(a,"QM");

ATAX0(a)=secda2(a,"ATAX");

MTAX0(a)=secda2(a,"MTAX");

ETAX0(a)=secda2(a,"ETAX");

QH0(a)=secda2(a,"QH");

GD0(a)=secda2(a,"GD");

QLD0(a)=secda2(a,"QLD");

YI0(a)=secda2(a,"YI");

\*dept(i)=secda2(i,"dept");

\*DEPRE0(i)=secda2(i,"DEPRE");

QKD0(a)=secda2(a,"QKD");

YK0(a)=secda2(a,"YK");

KL0(a)=QKD0(a)+QLD0(a);

QINT0(a)=KL0(a)+ND0(a);

INV0(a)=secda2(a,"INV");

STO0(a)=secda2(a,"STO");

SGDP0(a)=secda2(a,"SGDP");

PX0(a)=secda2(a,"PX");

PA0(a)=secda2(a,"PX");

\*TFP(i)=secda2(i,"TFP0");

hdye(a)=secda2(a,"hdye");

PL0(a)=YI0(a)/QLD0(a);

WL0=sum(a,YI0(a))/sum(a,QLD0(a));

wldist(a)=PL0(a)/WL0;

\*K0(i)=DEPRE0(i)/dept(i);

PK0(a)=YK0(a)/QKD0(a);

WK0=sum(a,YK0(a))/sum(a,QKD0(a));

wrdist(a)=PK0(a)/WK0;

Parameter secda3(\*)

/

EXR=1

TYL=1205880121

YHK=695770735

YHW=23802886.8

YHT=3520682372.8

EH=2672906392.8

SH=844329858

YWK=19852182

YEK=2584135265

transfrhent=0

ENTSAV=1861921267

HTAX=3446122

ENTAX=726170000

transfrrg=0

EG=1007912089

YG=994879558

transfrgent=0

transfrhg=315426345

transfrhr=0

GSAV=-6516264.996

FSAV=0

PGDP=1

WALRAS=0

frisch=-3

FTW=5645520

te=0

tq=0

tCO2=10

tCO=10

tSO2=10

tNOx=10

\*taxHCO2=0.4

\*taxHCO=0.3

\*taxHSO2=0.2

\*taxHNOx=0.1

/

;

EXR0=secda3("EXR");

TYL0=secda3("TYL");

YHK0=secda3("YHK");

YHW0=secda3("YHW");

YHT0=secda3("YHT ");

EH0=secda3("EH");

SH0=secda3("SH");

YWK0=secda3("YWK");

YEK0=secda3("YEK");

transfrhent0=secda3("transfrhent");

ENTSAV0=secda3("ENTSAV");

EG0=secda3("EG");

HTAX0=secda3("HTAX");

ENTAX0=secda3("ENTAX");

transfrrg0=secda3("transfrrg");

YG0=secda3("YG");

transfrgent0=secda3("transfrgent");

transfrhg0=secda3("transfrhg");

transfrhr0=secda3("transfrhr");

GSAV0=secda3("GSAV");

FSAV0=secda3("FSAV");

PGDP0=secda3("PGDP");

WALRAS0=secda3("WALRAS");

frisch=secda3("frisch");

FTW0=secda3("FTW");

tqj=secda3("tq");

\*\*\*\*\*

te(CE)=secda3("te");

tCO2=secda3("tCO2");

tCO=secda3("tCO");

tSO2=secda3("tSO2");

tNOx=secda3("tNOx");

\*taxHCO2=secda3("taxHCO2");

\*taxHCO=secda3("taxHCO");

\*taxHSO2=secda3("taxHSO2");

\*taxHNOx=secda3("taxHNOx");

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TABLE secda10(\*,n) tax(n)

 CO CO2 SO2 NOx

HH 0.3 0.4 0.2 0.1

;

tax(n)=secda10("HH",n);

TABLE secda11(ec,n) n pollutant discharge coefficient

 CO CO2 SO2 NOx

gas 0.1 0.1 0.1 0.1

petrol 0.2 0.2 0.2 0.2

kerosene 0.3 0.3 0.3 0.3

gasoline 0.4 0.4 0.4 0.4

coil 0.5 0.5 0.5 0.5

lpg 0.6 0.6 0.6 0.6

pow 0 0 0 0

;

emiss(ec,n)=secda11(ec,n);

\*emissco2(ec)=secda11(ec,"co2");

\*emissco(ec)=secda11(ec,"co");

\*emissso2(ec)=secda11(ec,"so2");

\*emissnox(ec)=secda11(ec,"nox");

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

THD0=sum(a,QH0(a));

hds(a)=QH0(a)/THD0;

mpci(a)=hds(a)\*hdye(a);

tmcpi=sum(a,mpci(a));

mpc(a)=mpci(a)/tmcpi;

LHD0(a)=QH0(a)+mpc(a)\*THD0/PX0(a)/frisch;

LHDz=sum(a,LHD0(a));

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TABLE secda1(a,\*) Energy dates of sectors in base year

 gas petrol kerosene gasoline coil lpg pow

agric 967.815137104 826.438109005 362.211196734 6586.666880717 216.664997303 54.267181014 30612.04455

othm 628.811616808 259.421813265 52.514792874 2822.140574610 76.492007797 4.149308000 3756.653089

food 3333.540563125 42.069957534 11.250127839 347.108979654 151.307315870 9.408452173 4571.425662

texti 548.792239875 25.266802658 22.182131924 51.674403454 17.765581735 5.393435990 4056.28649

furni 521.196658740 24.976929233 3.092973146 37.514161802 16.096095857 2.440439708 2303.109301

petr 9694.020095493 2842.234774918 145.960962667 28.357445193 932.033136932 5785.318024483 1314.082372

chemical 12940.301615448 906.649945224 1864.321841100 27.167826179 87.277640989 17135.476617744 5523.387644

nmetal 10812.510774044 70.693378742 43.837802304 507.039241871 1716.433176128 25.916683286 16712.76533

metal 7389.264620889 64.129411119 13.244439737 221.119666483 132.581791393 41.650277821 23861.73569

machi 1202.542871951 199.832765863 11.173444818 187.479379195 8.662455876 31.822201963 5299.110659

power 35882.773151734 5.105191147 0.000000000 7907.198035876 10030.246377151 0.389553659 36537.3365

gas 2318.640011799 6.725724210 2.810898627 0.452183669 0.000000000 0.025662242 220.0950441

water 66.402500000 24.722250000 1.312000000 23.295428571 0.000000000 1.581673307 3883.808554

const 284.777178375 478.421679886 107.209988684 2103.664293620 18.384315289 28.831254094 3974.213623

trans 2925.590983539 1880.675711672 56.690145703 11883.858119068 0.000000000 0.299579081 2976.623671

service 8342.691772818 297.623142883 418.288325761 502.403614199 279.045521459 198.307399456 51509.69099

;

QELE0(a)=secda1(a,"pow");

\*Epetr0(i)=Epetrol0(i)+Ekerosene0(i)+Ecoil0(i)+Egasoline0(i);

Epetr0(a)=secda1(a,"petrol")+secda1(a,"kerosene")+secda1(a,"gasoline")+secda1(a,"coil")+secda1(a,"lpg");

Egas0(a)=secda1(a,"gas");

QEEE0(a)=Epetr0(a)+Egas0(a);

QED0(a)=QELE0(a)+QEEE0(a);

TABLE secda13(ec,a) Energy dates of sectors in base year

 agric othm food texti furni petr chemical nmetal metal machi power gas water const trans service

gas 967.815137104 628.811616808 3333.540563125 548.792239875 521.196658740 9694.020095493 12940.301615448 10812.510774044 7389.264620889 1202.542871951 35882.773151734 2318.640011799 66.402500000 284.777178375 2925.590983539 8342.691772818

petrol 826.438109005 259.421813265 42.069957534 25.266802658 24.976929233 2842.234774918 906.649945224 70.693378742 64.129411119 199.832765863 5.105191147 6.725724210 24.722250000 478.421679886 1880.675711672 297.623142883

kerosene 362.211196734 52.514792874 11.250127839 22.182131924 3.092973146 145.960962667 1864.321841100 43.837802304 13.244439737 11.173444818 0.000000000 2.810898627 1.312000000 107.209988684 56.690145703 418.288325761

gasoline 6586.666880717 2822.140574610 347.108979654 51.674403454 37.514161802 28.357445193 27.167826179 507.039241871 221.119666483 187.479379195 7907.198035876 0.452183669 23.295428571 2103.664293620 11883.858119068 502.403614199

coil 216.664997303 76.492007797 151.307315870 17.765581735 16.096095857 932.033136932 87.277640989 1716.433176128 132.581791393 8.662455876 10030.246377151 0.000000000 0.000000000 18.384315289 0.000000000 279.045521459

lpg 54.267181014 4.149308000 9.408452173 5.393435990 2.440439708 5785.318024483 17135.476617744 25.916683286 41.650277821 31.822201963 0.389553659 0.025662242 1.581673307 28.831254094 0.299579081 198.307399456

pow 30612.04455 3756.653089 4571.425662 4056.28649 2303.109301 1314.082372 5523.387644 16712.76533 23861.73569 5299.110659 36537.3365 220.0950441 3883.808554 3974.213623 2976.623671 51509.69099

;

EINT(ec,a)=secda13(ec,a);

TABLE secda4(ec,\*) Energy dates of household

 h

gas 1000

petrol 900

kerosene 800

gasoline 700

coil 600

lpg 500

pow 400

;

QHH0(ec)=secda4(ec,"h");

TABLE secda5(ec,\*) Physical transformation coefficient

 thete

gas 0.8

petrol 0.7

kerosene 0.6

gasoline 0.5

coil 0.4

lpg 0.3

pow 0

;

thete(ec)=secda5(ec,"thete");

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

PND0(a)=PX0(a);

PQINT0(a)=PX0(a);

PKL0(a)=PX0(a);

WE0(a)=PX0(a);

PQEEE0(a)=PX0(a);

Pgas0(a)=PX0(a);

Ppetr0(a)=PX0(a);

PELE0(a)=PX0(a);

PDC0(c)= PX0(c);

PQ0(c)=PX0(c);

PWM0(c)=PX0(c);

PWE0(c)=PX0(c);

PEC0(c)=PX0(c);

TYK0=sum(a,YK0(a));

EINV0=sum(a,INV0(a));

TSAV0=ENTSAV0+SH0+GSAV0+FSAV0;

QLS0=sum(a,QLD0(a));

QKS0=sum(a,QKD0(a));

RGDP0=sum(c,QH0(c))+sum(c,GD0(c))+sum(a,INV0(a))+sum(a,STO0(a))+sum(CE,QEC0(CE))

 -sum(cm,QM0(cm))-sum(cm,MTAX0(cm));

GDP0=sum(a,SGDP0(a));

TABLE elast(\*,a) Elasticity dates

 agric othm food texti furni petr chemical nmetal metal machi power gas water const trans service

rhoQX 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

rhoQINT 0.5 0.2 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.2 0.2 0.3 0.5 0.9 0.5

rhoKL 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3

rhoE 0.7 0.3 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.1 0.3 0.3 0.3 0.7 0.3

rhoQEEE 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

rhoCET 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

;

rhoQX(a)=elast("rhoQX",a);

rhoQINT(a)=elast("rhoQINT",a);

rhoKL(a)=elast("rhoKL",a);

rhoE(a)=elast("rhoE",a);

rhoQEEE(a)=elast("rhoQEEE",a);

rhoCET(a)=elast("rhoCET",a);

TABLE elast2(\*,cm)

 agric othm food texti furni petr chemical nmetal metal machi trans service

rhoQQ 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8

;

rhoQQ(cm)=elast2("rhoQQ",cm);

\*\*\*\*\*\*\*\*\*\*\*4 Parameters Calibration---------------------------------------------

ca(ean,a)=UND0(ean,a)/ND0(a);

tm(c)$(QM0(c)>0)=MTAX0(c)/QM0(c);

tm(c)$(QM0(c)=0)=0;

ta(a)=ATAX0(a)/QX0(a);

ratehk=YHK0/TYK0;

ratehw=YHW0/sum(a,QM0(a));

savh=SH0/(TYL0+YHK0+transfrhent0+transfrhg0+YHW0);

ratewk=YWK0/TYK0;

ratehe=transfrhent0/YEK0;

ratefw=FTW0/YHT0;

rateeg=transfrgent0/YG0;

stoinv(a)=STO0(a)/QX0(a);

invest(a)=INV0(a)/EINV0;

tih=HTAX0/(TYL0+YHK0+transfrhent0+transfrhg0+YHW0);

tient=ENTAX0/YEK0;

rategw=transfrrg0/sum(c,QM0(c));

ratehg=transfrhg0/(sum(c,MTAX0(c))+sum(a,ATAX0(a))+HTAX0+ ENTAX0+transfrrg0);

ratewg=transfrhr0/(sum(c,MTAX0(c))+sum(a,ATAX0(a))+HTAX0+ENTAX0+transfrrg0);

savg=GSAV0/(sum(c,MTAX0(c))+sum(a,ATAX0(a))+HTAX0+ENTAX0+transfrrg0);

cong(a)=GD0(a)/sum(c,GD0(c));

QQ0(c)=QDC0(c)+QM0(c)+tm(c)\*QM0(c);

te(c)=ETAX0(c)/(sum(a,QEC0(a)));

\*I should correct later

\*\*\*\*\*\*\*\*\*\* 4.2 Elasticity and Share Parameters Calibration ---------------------

parQX(a)=(rhoQX(a)-1)/rhoQX(a);

parQINT(a)=(rhoQINT(a)-1)/rhoQINT(a);

parKL(a)=(rhoKL(a)-1)/rhoKL(a);

parE(a)=(rhoE(a)-1)/rhoE(a);

parQEEE(a)=(rhoQEEE(a)-1)/rhoQEEE(a);

parQQ(c)$(cm(c) and CX(c))=(rhoQQ(c)-1)/rhoQQ(c);

\*parQQ(c)$(NOT cm(c) and CX(c))=1;

parCET(c)$(CE(c) and CX(c))=(rhoCET(c)-1)/rhoCET(c);

\*parCET(c)$(NOT CE(c) and CX(c))=0;

deltaEpetr(a)=((Epetr0(a)/Egas0(a))\*\*(1-parQEEE(a))\*(ppetr0(a)/pgas0(a)))/(1+(Epetr0(a)/Egas0(a))\*\*(1-parQEEE(a))\*(ppetr0(a)/pgas0(a)));

deltaEgas(a)=1-deltaEpetr(a);

scaleQEEE(a)=QEEE0(a)/(deltaEpetr(a)\*Epetr0(a)\*\*(parQEEE(a))+deltaEgas(a)\*Egas0(a)\*\*(parQEEE(a)))\*\*(1/parQEEE(a));

deltaQEEE(a)=((QEEE0(a)/QELE0(a))\*\*(1-parE(a))\*(PQEEE0(a)/PELE0(a)))/(1+(QEEE0(a)/QELE0(a))\*\*(1-parE(a))\*(PQEEE0(a)/PELE0(a)));

deltaQELE(a)=1-deltaQEEE(a);

scaleE(a)=QED0(a)/(deltaQEEE(a)\*QEEE0(a)\*\*(-parE(a))+deltaQELE(a)\*QELE0(a)\*\*(-parE(a)))\*\*(-1/parE(a));

deltaK(a)=((QKD0(a)/QLD0(a))\*\*(1-parKL(a))\*(Pk0(a)/PL0(a)))/(1+(QKD0(a)/QLD0(a))\*\*(1-parKL(a))\*(PK0(a)/PL0(a)));

deltaL(a)=1-deltaK(a);

scaleKL(a)=KL0(a)/(deltaK(a)\*QKD0(a)\*\*(parKL(a))+deltaL(a)\*QLD0(a)\*\*(parKL(a)))\*\*(1/parKL(a));

deltaKL(a)=((KL0(a)/ND0(a))\*\*(1-parQINT(a))\*(PKL0(a)/PND0(a)))/(1+(KL0(a)/ND0(a))\*\*(1-parQINT(a))\*(PKL0(a)/PND0(a)));

deltaND(a)=1-deltaKL(a);

scaleQINT(a)=QINT0(a)/(deltaKL(a)\*KL0(a)\*\*(-parQINT(a))+deltaND(a)\*ND0(a)\*\*(-parQINT(a)))\*\*(-1/parQINT(a));

deltaE(a)=((QED0(a)/QINT0(a))\*\*(1-parQX(a))\*(WE0(a)/PQEEE0(a)))/(1+(QED0(a)/QINT0(a))\*\*(1-parQX(a))\*(WE0(a)/PQINT0(a)));

deltaQINT(a)=1-deltaE(a);

scaleQX(a)=QX0(a)/(deltaE(a)\*QED0(a)\*\*(-parQX(a))+deltaQINT(a)\*QINT0(a)\*\*(-parQX(a)))\*\*(-1/parQX(a));

\*deltaE(i)=(E0(i)/QX0(i))\*\*(1-parQX(i))\*(PE0(i)/PQX0(i));

\*deltaKLND(i)=1-deltaE(i);

\*deltaKLND(i)=(KLND0(i)/QX0(i))\*\*(1-parQX(i))\*(PKLND0(i)/PQX0(i));

deltaQM(c)$(cm(c) and CX(c))=(1+tm(c))\*QM0(c)\*\*(1-parQQ(c))/(QDC0(c)\*\*(1-parQQ(c))+(1+tm(c))\*QM0(c)\*\*(1-parQQ(c)));

deltaQDC(c)$(cm(c) and CX(c))=1-deltaQM(c);

scaleQQ(c)$(cm(c) and CX(c))=QQ0(c)/(deltaQM(c)\*QM0(c)\*\*(-parQQ(c))+deltaQDC(c)\*QDC0(c)\*\*(-parQQ(c)))\*\*(-1/parQQ(c));

deltaQEC(c)$(CE(c) and CX(c))=QEC0(c)\*\*(1+parCET(c))/(QDC0(c)\*\*(1+parCET(c))+QEC0(c)\*\*(1+parCET(c)));

deltaQDCC(c)$(CE(c) and CX(c))=1-deltaQEC(c);

scaleCET(c)$(CE(c) and CX(c))=QX0(c)/(deltaQEC(c)\*QEC0(c)\*\*parCET(c)+deltaQDCC(c)\*QDC0(c)\*\*parCET(c))\*\*(1/parCET(c));

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

display

deltaQEC, deltaQDCC, parCET;

\*\*\*\*\*\*\*\*\*\*\*5. Model System Definition ----------------------------------------

\*\*\*\*\*\*\*\*\*\*\*\*5.1 Variable Definition---------------------------------------------

\*\*\*\*\*Production function Variable (25)------------------------------------------

variable

QEEE(a) Energy factor input of fossil (petr-gas)

Epetr(a) Energy factor input of petr

Egas(a) Energy factor input of gas

QED(a) Energy composite factor input

QELE(a) Energy factor input of power

QINT(a) Capital-Labor-Intermediate composite factor input

KL(a) Capital-Labor composite factor input

QLD(a) Labor factor input

QKD(a) Capital factor input

ND(a) Intermediate input of the i-th sector

UND(ean,a) Unit intermediate input

QX(a) Output of the i-th sector

QA(a) Output of the i-th sector

WL Relatively Price of the Labor factor

PL(a)

WK Relatively Price of the Capital factor

PK(a)

WE(a) Price of the Energy composite factor

PQEEE(a) Price of the fossil (petr-gas) composite factor

Pgas(a) Price of the gas composite factor

Ppetr(a) Price of the petr composite factor

PELE(a) Price of the power composite factor

PX(a) Price of the i-th sector

PA(a) Price of the i-th sector

PQINT(a) Price of the Capital-Labor-intermediate composite factor

PND(a) Price of the intermediate input the i-th sector

PKL(a) Price of the Capital-Labor composite factor

\*\*\*\*\*\*\*\*\*\*\*\*\*Trade function Variable(11)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

QQ(c) Armington's composite good

QDC(c) Armington's domestic good CET's domestic good

QDS CET domestic good CET's domestic good

QM(c) Imports good

QEC(c) Exports good

\*PQ(c) Armington's composite good price

\*PDC(c) The j-th domestic good price

\*PM(c) Import price in local currency

\*PEC(c) Export price in local currency

\*EXR Exchange rate in base year

\*PWM(c) Import international price

\*PWE(c) Export international price

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*PMco2(c)

\*PMco(c)

\*PMso2(c)

\*PMnox(c)

\*\*\*\*\*\*\*\*\*\*\*Household function Variable(11)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

YI(a) the income of household labor from the i-th sector

TYL the total income of household from labor

YHK the total income of household from capital

YHW the total income of household from foreign

YHT the total income of household

SH the saving of household

QH(c) the consumption of household to the i-th good

transfrhent the transfer payments of the enterprise to household

FTW the transfer payments of household to otherworld

EH Household consumption expenditure

LHD At least household consumption demand from j-th good

\*\*\*\*\*\*\*\*\*Enterprise function Variable(7)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

YK(a) the income of capital from the i-th sector

TYK the total income from capital

YWK the income of foreign from capital

YEK the income of enterprise capital

ENTSAV the saving of enterprise

STO(c)

\*\*\*\*\*\*\*\*\*\*\*\*\*Government function Variable(13)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

ATAX(c) the income of government from the i-th sector indirect tax

MTAX(c) the income of government from the i-th good tariff tax

HTAX the income of government from household income tax

ENTAX the income of government from enterprise income tax

transfrrg the income of government from foreign

ETAX the income of government from export tax

YG the total income of government

transfrhg the transfer payments of government to household

transfrgent the transfer payments of government to enterprise

transfrhr the payments of government to foreign

GSAV the saving of government

GD(c) the consumption of government to the j-th good

EG the government expenses

\*\*\*\*\*\*\*\*\*\*Environmental function variable()\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*QPE(n,a) The amount of n released by the manufacturing sector a

QPEco2(a) The amount of CO2 released by the manufacturing sector i

QPEco(a) The amount of CO released by the manufacturing sector i

QPEso2(a) The amount of SO2 released by the manufacturing sector i

QPEnox(a) The amount of NOx released by the manufacturing sector i

\*TTAX(n,a) co2 ad valorem rate

TAXco2(a) co2 ad valorem rate

TAXco(a) co ad valorem rate

TAXso2(a) so2 ad valorem rate

TAXnox(a) nox ad valorem rate

HHT(n) The amount of household environmental tax

\*HHTco2 The amount of household environmental tax

\*HHTco The amount of household environmental tax

\*HHTso2 The amount of household environmental tax

\*HHTnox The amount of household environmental tax

QHH(ec) Household Demand for Energy ec

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*TTAX(co2,a)

\*TTAX(co,a)

\*TTAX(so2,a)

\*TTAX(nox,a)

\*\*\*\*\*\*\*\*\*\*\*Equilibrium function variable(9)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FSAV the saving of foreign

EINV the total investing

INV(a) the investment

TSAV the total saving

RGDP the real GDP

SGDP(a) the nominal GDP of the i-th sector

GDP the nominal GDP in base year

PGDP the GDP price index

WALRAS the walras

\*\*\*\*\*\*\*\*\*\*\*Welfare function variable(1)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*EV the equivalent value

;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

positive variable

PQ(c) Armington's composite good price

PDC(c) The j-th domestic good price

PM(c) Import price in local currency

PEC(c) Export price in local currency

EXR Exchange rate in base year

PWM(c) Import international price

PWE(c) Export international price

;

\*\*\*\*\*\*\*\*\*5.2 equation definition\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*Production function definition(22)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Equation

eqQEEE(a) Energy factor input of fossil (petr-gas)

eqEpetr(a) Energy factor input of petr

eqEgas(a) Energy factor input of gas

eqQED(a) Energy composite factor input

eqQELE(a) Energy factor input of power

eqQINT(a) Capital-Labor-Intermediate composite factor input

eqKL(a) Capital-Labor composite factor input

eqQLD(a) Labor factor input

eqQKD(a) Capital factor input

eqND(a) Intermediate input of the i-th sector

eqUND(ean,a) Unit intermediate input

eqWE(a) Price of the Energy composite factor

eqQEEE(a) Price of the fossil (petr-gas) composite factor

eqPQEEE(a)

\*eqPX(a) Price of the i-th sector

eqPA(a) Price of the i-th sector

eqPQINT(a) Price of the Capital-Labor-intermediate composite factor

eqPND(a) Price of the intermediate input the i-th sector

eqPKL(a) Price of the Capital-Labor composite factor

eq1(a)

eq2(a)

eq3(a)

eq4(a)

eq5(a)

\*\*\*\*\*\*\*\*\*\*\*\*\*Trade function definition(10)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqPM(c) Import price in local currency

eqPEC(c) Export price in local currency

eqdov the nominal value of domestic production

eqQX(c) CET's composite good

\*eqQDC(c)

eqQEC(c) Exports good

eqjazb jazb

eqQDs

eqQQ(c) Armington's composite good

eqQM(c) Imports good

eqQDC(c) Armington's domestic good CET's domestic good

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*eqPMco2(c)

\*eqPMco(c)

\*eqPMso2(c)

\*eqPMnox(c)

\*\*\*\*\*\*\*\*\*\*\*Household function definition(10)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqYI(a) the income of household labor from the i-th sector

eqTYL the total income of household from labor

eqYHK the total income of household from capital

eqYHW the total income of household from foreign

eqYHT the total income of household

eqSH the saving of household

eqQH(c) the consumption of household to the i-th good

eqFTW the transfer payments of household to otherworld

eqEH Household consumption expenditure

eqLHD At least household consumption demand from j-th good

\*\*\*\*\*\*\*\*\*Enterprise function definition(7)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqYK(a) the income of capital from the i-th sector

eqTYK the total income from capital

eqYWK the income of foreign from capital

eqYEK the income of enterprise capital

eqtransfrhent the transfer payments of the enterprise to household

eqENTSAV the saving of enterprise

eqSTO(c)

\*\*\*\*\*\*\*\*\*\*\*\*\*Government function definition(13)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqATAX(c) the income of government from the i-th sector indirect tax

eqMTAX(c) the income of government from the i-th good tariff tax

eqHTAX the income of government from household income tax

eqENTAX the income of government from enterprise income tax

eqtransfrrg the income of government from foreign

eqETAX the income of government from export tax

eqYG the total income of government

eqtransfrhg the transfer payments of government to household

eqtransfrgent the transfer payments of government to enterprise

eqtransfrhr the payments of government to foreign

eqGSAV the saving of government

eqGD(c) the consumption of government to the j-th good

eqEG the government expenses

\*\*\*\*\*\*\*\*\*\*Environmental function definition()\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*eqQPE(n,a) The amount of n released by the manufacturing sector a

eqQPEco2(a) The amount of CO2 released by the manufacturing sector a

eqQPEco(a) The amount of CO released by the manufacturing sector a

eqQPEso2(a) The amount of SO2 released by the manufacturing sector a

eqQPEnox(a) The amount of NOx released by the manufacturing sector a

\*eqTTAX(n,a) co2 ad valorem rate

eqTAXco2(a) co2 ad valorem rate

eqTAXco(a) co ad valorem rate

eqTAXso2(a) so2 ad valorem rate

eqTAXnox(a) nox ad valorem rate

eqHHT(n) The amount of household environmental tax

\*eqHHTco2 The amount of household environmental tax

\*eqHHTco The amount of household environmental tax

\*eqHHTso2 The amount of household environmental tax

\*eqHHTnox The amount of household environmental tax

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*eqTTAX(co2,a)

\*eqTTAX(co,a)

\*eqTTAX(so2,a)

\*eqTTAX(nox,a)

\*\*\*\*\*\*\*\*\*\*\*Equilibrium function definition(12)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqPayequi Payments equilibrium

eqEINV the total investing

eqINV(a) the investment

eqSDequi1 Supply and demand equilibrium

eqSDequi2

eqSDequi3

eqSDequi4

eqSDequi5

eqSDequi6

eqSDequi7

eqSDequi8

eqSDequi9

eqSDequi10

eqSDequi11

eqSDequi12

eqSDequi13

eqSDequi14

eqSDequi15

eqSDequi16

eqCapequi equilibrium the Capital market

eqLabequi Equilibrium the labor market

eqTSAV the total saving

eqRGDP the real GDP

eqSGDP(a) the nominal GDP of the i-th sector

eqGDP the nominal GDP in base year

eqPGDP the GDP price index

eqBudequi Equilibrium the goverment's budget

\*\*\*\*\*\*\*\*\*\*\*Welfare function definition(1)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*eqEV the equivalent value

;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Production Block(22)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqQED(a).. QED(a)=e=QA(a)\*(PA(a)/WE(a))\*\*(1/(1+parQX(a)))\*(deltaE(a)+0.00001)\*\*(1/(1+parQX(a)));

eqQINT(a).. QINT(a)=e=QA(a)\*(PA(a)/PQINT(a))\*\*(1/(1+parQX(a)))\*deltaQINT(a)\*\*(1/(1+parQX(a)));

eqPA(a).. QA(a)=e=scaleQX(a)\*(deltaE(a)\*QED(a)\*\*(-parQX(a))+deltaQINT(a)\*QINT(a)\*\*(-parQX(a)))\*\*(-1/parQX(a));

eq5(a).. PA(a)\*QA(a)\*(1-ta(a))=e=WE(a)\*QED(a)+PQINT(a)\*QINT(a);

eqUND(ean,a).. UND(ean,a)=e=(UND0(ean,a)/ND0(a))\*ND(a);

eqPND(a).. PND(a)=e=sum(ean,ca(ean,a)\*PX(ean));

eqND(a).. ND(a)=e=QINT(a)\*(PQINT(a)/PND(a))\*\*(1/(1+parQINT(a)+0.00001))\*deltaND(a)\*\*(1/(1+parQINT(a)+0.00001));

eqKL(a).. KL(a)=e=QINT(a)\*(PQINT(a)/PKL(a))\*\*(1/(1+parQINT(a)+0.00001))\*deltaKL(a)\*\*(1/(1+parQINT(a)+0.00001));

eqPQINT(a).. QINT(a)=e=scaleQINT(a)\*(deltaKL(a)\*KL(a)\*\*(-parQINT(a))+deltaND(a)\*ND(a)\*\*(-parQINT(a)))\*\*(-1/parQINT(a));

eq4(a).. PQINT(a)\*QINT(a)=e=PKL(a)\*KL(a)+PND(a)\*ND(a);

eqQKD(a).. QKD(a)=e=KL(a)\*(PKL(a)/PK(a))\*\*(1/1+parKL(a))\*deltaK(a)\*\*(1/1+parKL(a));

eqQLD(a).. QLD(a)=e=KL(a)\*(PKL(a)/PL(a))\*\*(1/1+parKL(a))\*deltaL(a)\*\*(1/1+parKL(a));

eqPKL(a).. KL(a)=e=scaleKL(a)\*(deltaK(a)\*QKD(a)\*\*(-parKL(a))+deltaL(a)\*QLD(a)\*\*(-parKL(a)))\*\*(-1/parKL(a));

eq3(a).. PKL(a)\*KL(a)=e=PK(a)\*QKD(a)+PL(a)\*QLD(a);

eqQEEE(a).. QEEE(a)=e=QED(a)\*(WE(a)/PQEEE(a))\*\*(1/(1+parE(a)))\*deltaQEEE(a)\*\*(1/(1+parE(a)));

eqQELE(a).. QELE(a)=e=QED(a)\*(WE(a)/PELE(a))\*\*(1/(1+parE(a)))\*deltaQELE(a)\*\*(1/(1+parE(a)));

eqWE(a).. QED(a)=e=scaleE(a)\*(deltaQEEE(a)\*QEEE(a)\*\*(-parE(a))+deltaQELE(a)\*QELE(a)\*\*(-parE(a)))\*\*(-1/parE(a));

eq2(a).. WE(a)\*QED(a)=e=PQEEE(a)\*QEEE(a)+PELE(a)\*QELE(a);

eqEpetr(a).. Epetr(a)=e=QEEE(a)\*(PQEEE(a)/Ppetr(a))\*\*(1/(1+parQEEE(a)))\*deltaEpetr(a)\*\*(1/(1+parQEEE(a)));

eqEgas(a).. Egas(a)=e=QEEE(a)\*(PQEEE(a)/Pgas(a))\*\*(1/(1+parQEEE(a)))\*deltaEgas(a)\*\*(1/(1+parQEEE(a)));

eqPQEEE(a).. QEEE(a)=e=scaleQEEE(a)\*(deltaEpetr(a)\*Epetr(a)\*\*(-parQEEE(a))+deltaEgas(a)\*Egas(a)\*\*(-parQEEE(a)))\*\*(-1/parQEEE(a));

eq1(a).. PQEEE(a)\*QEEE(a)=e=Ppetr(a)\*Epetr(a)+Pgas(a)\*Egas(a);

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Trade Block(10)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

PM.fx(c)$(not cm(c))=0;

\*PMco2.fx(c)$(not cm(c))=0;

\*PMco.fx(c)$(not cm(c))=0;

\*PMso2.fx(c)$(not cm(c))=0;

\*PMnox.fx(c)$(not cm(c))=0;

PEC.fx(c)$(not CE(c))=0;

\*QE.fx(c)$(not CE(c))=0;

\*QM.FX(c)$(not cm(c))=0;

pwe.fx(c)$(not CE(c))=0;

pwm.fx(c)$(not cm(c))=0;

eqPM(c)$(CM(c)and CX(c)).. PM(c)=e=(1-(TAXco2(c)+TAXco(c)+TAXso2(c)+TAXnox(c)))\*pwm(c)\*(1+tm(c))\*EXR;

\*$(CM(c))

\*eqPMco2(c).. PMco2(c)=e=(1-TAXco2(c))\*pwm(c)\*(1+tm(c))\*EXR;

\*eqPMco(c).. PMco(c)=e=(1-TAXco(c))\*pwm(c)\*(1+tm(c))\*EXR;

\*eqPMso2(c).. PMso2(c)=e=(1-TAXso2(c))\*pwm(c)\*(1+tm(c))\*EXR;

\*eqPMnox(c).. PMnox(c)=e=(1-TAXnox(c))\*pwm(c)\*(1+tm(c))\*EXR;

eqPEC(c)$(CE(c)).. PEC(c)=e=pwe(c)\*(1-te(c))\*EXR;

eqdov(c).. (1-(TAXco2(c)+TAXco(c)+TAXso2(c)+TAXnox(c)))\*PX(c)\*QX(c)=e=PDC(c)\*QDC(c)+PEC(c)\*QEC(c);

eqQX(c)$(CE(c)and CX(c)).. QX(c)=e=scaleCET(c)\*(deltaQDCC(c)\*QDC(c)\*\*(parCET(c))+deltaQEC(c)\*QEC(c)\*\*(parCET(c)))\*\*(1/(parCET(c)));

eqQDs(c).. QDS(c)=e=QX(c)\*(PX(c)/PDC(c))\*\*(1/(1-parCET(c)))\*deltaQDCC(c)\*\*(1/(1-parCET(c)));

eqQEC(c)$(CE(c)and CX(c)).. QEC(c)=e=QX(c)\*(PX(c)/PEC(c))\*\*(1/(1-parCET(c)))\*deltaQEC(c)\*\*(1/(1-parCET(c)));

eqjazb(c).. PQ(c)\*QQ(c)=e=PDC(c)\*QDC(c)+PM(c)\*QM(c)\*(1-(TAXco2(c)+TAXco(c)+TAXso2(c)+TAXnox(c)));

\*\*\*\*\*\*\*\*\*\*\*

eqQQ(c)$(CM(c)and CX(c)).. QQ(c)=e=scaleQQ(c)\*(deltaQM(c)\*QM(c)\*\*(-parQQ(c))+deltaQDC(c)\*QDC(c)\*\*(-parQQ(c)))\*\*(-1/parQQ(c));

eqQM(c)$(CM(c)and CX(c)).. QM(c)=e=QQ(c)\*(PQ(c)/(PM(c)+0.00001))\*\*(1/(1+parQQ(c)))\*deltaQM(c)\*\*(1/(1+parQQ(c)));

eqQDC(c)$(CX(c)).. QDC(c)=e=QQ(c)\*(PQ(c)/PDC(c))\*\*(1/(1+parQQ(c)))\*deltaQDC(c)\*\*(1/(1+parQQ(c)));

\*(1/(1-parQQ(c)))

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Income and Expenditure Block\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Household function(10)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqYI(a).. YI(a)=e=WL\*WLdist(a)\*QLD(a);

eqTYL.. TYL=e=sum(a,YI(a));

eqYHK.. YHK=e=ratehk\*TYK;

eqYHW.. YHW=e=ratehw\*sum(c,pwm(c)\*QM(c));

eqYHT.. YHT=e=TYL+YHK+transfrhent+transfrhg+YHW;

eqSH.. SH=e=savh\*YHT;

eqEH.. EH=e=YHT-SH-HTAX;

eqLHD.. LHD=e=sum(c,LHD0(c)\*PQ(c));

eqQH(c).. QH(c)\*PQ(c)=e=LHD0(c)\*PQ(c)+mpc(c)\*(EH-LHD);

eqFTW.. FTW=e=ratefw\*YHT;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Enterprise function(7)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqYK(a).. YK(a)=e=WK\*wrdist(a)\*QKD(a);

eqTYK.. TYK=e=sum(a,YK(a));

eqYWK.. YWK=e=ratewk\*TYK;

eqYEK.. YEK=e=(1-ratehk-ratewk)\*TYK;

eqtransfrhent.. transfrhent=e=ratehe\*YEK;

eqENTSAV.. ENTSAV=e=YEK-transfrhent-ENTAX;

eqSTO(a).. STO(a)=e=stoinv(a)\*QX(a);

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Government function(13)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqATAX(a).. ATAX(a)=e=ta(a)\*PX(a)\*QX(a);

eqMTAX(c).. MTAX(c)=e=tm(c)\*PWM(c)\*QM(c);

eqHTAX.. HTAX=e=tih\*YHT;

eqENTAX.. ENTAX=e=tient\*YEK;

eqtransfrrg.. transfrrg=e=rategw\*sum(c,pwm(c)\*QM(c));

eqETAX.. ETAX=e=sum(c,te(c)\*pwe(c)\*QEC(c)\*EXR);

eqYG.. YG=e=sum(a,ATAX(a))+sum(c,MTAX(c))+HTAX+ENTAX+transfrrg+ETAX;

eqGSAV.. GSAV=e=savg\*YG;

eqtransfrhg.. transfrhg=e=ratehg\*YG;

eqtransfrhr.. transfrhr=e=ratewg\*YG;

eqtransfrgent.. transfrgent=e=rateeg\*YG;

eqGD(c).. GD(c)=e=cong(c)\*(1-ratehg-ratewg-rateeg-savg)\*YG/PX(c);

eqEG.. EG=e=sum(c,PX(c)\*GD(c))+transfrhg+transfrhr+transfrgent;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Environment Block()\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*eqQPE(n,a).. QPE(n,a)=e=sum(ec,EINT(ec,a)\*thete(ec)\*emiss(ec,n));

eqQPEco2(a).. QPEco2(a)=e=sum(ec,EINT(ec,a)\*thete(ec)\*emiss(ec,"co2"));

eqQPEco(a).. QPEco(a)=e=sum(ec,EINT(ec,a)\*thete(ec)\*emiss(ec,"co"));

eqQPEso2(a).. QPEso2(a)=e=sum(ec,EINT(ec,a)\*thete(ec)\*emiss(ec,"so2"));

eqQPEnox(a).. QPEnox(a)=e=sum(ec,EINT(ec,a)\*thete(ec)\*emiss(ec,"nox"));

\*eqTTAX(co2,a).. TTAX("co2",a)=e=(tco2\*QPE("co2",a))/(QX(a)\*PX(a));

\*eqTTAX(co,a).. TTAX("co",a)=e=(tco\*QPE("co",a))/(QX(a)\*PX(a));

\*eqTTAX(so2,a).. TTAX("so2",a)=e=(tso2\*QPE("so2",a))/(QX(a)\*PX(a));

\*eqTTAX(nox,a).. TTAX("nox",a)=e=(tnox\*QPE("nox",a))/(QX(a)\*PX(a));

eqTAXco2(a).. TAXco2(a)=e=(tco2\*QPEco2(a))/(QX(a)\*PX(a));

eqTAXco(a).. TAXco(a)=e=(tco\*QPEco(a))/(QX(a)\*PX(a));

eqTAXso2(a).. TAXso2(a)=e=(tso2\*QPEso2(a))/(QX(a)\*PX(a));

eqTAXnox(a).. TAXnox(a)=e=(tnox\*QPEnox(a))/(QX(a)\*PX(a));

eqHHT(n).. HHT(n)=e=tax(n)\*sum(ec,QHH(ec)\*thete(ec)\*emiss(ec,n));

\*eqHHTco2.. HHTco2=e=taxHco2\*sum(ec,QH(ec)\*thete(ec)\*emissco2(ec));

\*eqHHTco.. HHTco=e=taxHco\*sum(ec,QH(ec)\*thete(ec)\*emissco(ec));

\*eqHHTso2.. HHTso2=e=taxHso2\*sum(ec,QH(ec)\*thete(ec)\*emissso2(ec));

\*eqHHTnox.. HHTnox=e=taxHnox\*sum(ec,QH(ec)\*thete(ec)\*emissnox(ec));

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Model Closure and Market Clearing(27)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

eqPayequi.. sum(c,pwm(c)\*QM(c))+YWK+transfrhr=e=sum(c,pwe(c)\*QEC(c))+YHW+transfrrg+FSAV0\*EXR;

eqTSAV.. TSAV=e=ENTSAV+GSAV+SH+FSAV0\*EXR;

eqEINV.. EINV=e=TSAV-sum(a,STO(a)\*PX(a))+WALRAS;

eqINV(a).. INV(a)=e=invest(a)\*EINV/PX(a);

eqSDequi1.. QH('agric')+GD('agric')+INV('agric')+STO('agric')+sum(a,UND('agric',a))=e=QQ('agric');

eqSDequi2.. QH('othm')+GD('othm')+INV('othm')+STO('othm')+sum(a,UND('othm',a))=e=QQ('othm');

eqSDequi3.. QH('food ')+GD('food')+INV('food')+STO('food')+sum(a,UND('food',a))=e=QQ('food ');

eqSDequi4.. QH('texti')+GD('texti')+INV('texti')+STO('texti')+sum(a,UND('texti',a))=e=QQ('texti');

eqSDequi5.. QH('furni')+GD('furni')+INV('furni')+STO('furni')+sum(a,UND('furni',a))=e=QQ('furni');

eqSDequi6.. QH('petr')+GD('petr')+INV('petr')+STO('petr')+0=e=QQ('petr');

eqSDequi7.. QH('chemical')+GD('chemical')+INV('chemical')+STO('chemical')+sum(a,UND('chemical',a))=e=QQ('chemical');

eqSDequi8.. QH('nmetal')+GD('nmetal')+INV('nmetal')+STO('nmetal')+sum(a,UND('nmetal',a))=e=QQ('nmetal');

eqSDequi9.. QH('metal')+GD('metal')+INV('metal')+STO('metal')+sum(a,UND('metal',a))=e=QQ('metal');

eqSDequi10.. QH('machi')+GD('machi')+INV('machi')+STO('machi')+sum(a,UND('machi',a))=e=QQ('machi');

eqSDequi11.. QH('power')+GD('power')+INV('power')+STO('power')+0=e=QQ('power');

eqSDequi12.. QH('gas')+GD('gas')+INV('gas')+STO('gas')+0=e=QQ('gas');

eqSDequi13.. QH('water')+GD('water')+INV('water')+STO('water')+sum(a,UND('water',a))=e=QQ('water');

eqSDequi14.. QH('const')+GD('const')+INV('const')+STO('const')+sum(a,UND('const',a))=e=QQ('const');

eqSDequi15.. QH('trans')+GD('trans')+INV('trans')+STO('trans')+sum(a,UND('trans',a))=e=QQ('trans');

eqSDequi16.. QH('service')+GD('service')+INV('service')+STO('service')+sum(a,UND('service',a))=e=QQ('service');

eqCapequi.. sum(a,QKD(a))=e=QKS0;

eqLabequi.. sum(a,QLD(a))=e=QLS0;

eqRGDP.. RGDP=e=sum(c,QH(c))+sum(c,GD(c))+ sum(c,INV(c))+sum(c,STO(c))+sum(ce,QEC(ce))-sum(cm,QM(cm))-sum(cm,(MTAX(cm)/pwm(cm)));

eqSGDP(a).. SGDP(a)=e=WL\*wldist(a)\*QLD(a)+WK\*wrdist(a)\*QKD(a)+ta(a)\*PX(a)\*QX(a);

eqGDP.. GDP=e=sum(a,WK\*wrdist(a)\*QKD(a))+sum(a,WL\*wldist(a)\*QLD(a))+sum(a,ta(a)\*PX(a)\*QX(a));

eqPGDP.. PGDP=e=GDP/RGDP;

eqBudequi.. YG=e=EG+GSAV;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Welfare Block(1)\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*eqEV.. EV=e=sum(j,PQX0(j)\*HD(j))-sum(j,PQX0(j)\*HD0(j));

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Variable Initialization\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*6.2 Endogenous Variable Initialization\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

QX.l(a)=QX0(a); ND.l(a)=ND0(a); UND.l(ean,a)= UND0(ean,a); QA.l(a)=QA0(a);

QINT.l(a)=QINT0(a); KL.l(a)=KL0(a); QLD.l(a)=QLD0(a); QKD.l(a)=QKD0(a);

QED.l(a)=QED0(a);

QEEE.l(a)=QEEE0(a);

Epetr.l(a)=Epetr0(a); Egas.l(a)=Egas0(a); QELE.l(a)=QELE0(a);

PX.l(a)=PX0(a); PA.l(a)=PA0(a); PND.l(a)=PND0(a);

PQINT.l(a)=PQINT0(a); PKL.l(a)=PKL0(a); WL.l=WL0; WK.l=WK0;

WE.l(a)=WE0(a); PQEEE.l(a)=PQEEE0(a); PL.l(a)=PL0(a);

Ppetr.l(a)=Ppetr0(a); Pgas.l(a)=Pgas0(a); PK.l(a)=PK0(a);

QELE.l(a)=QELE0(a); PELE.l(a)=PELE0(a);

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

QQ.l(c)=QQ0(c); QDC.l(c)=QDC0(c); QM.l(c)=QM0(c); QEC.l(c)=QEC0(c);

PQ.l(c)=PQ0(c); PDC.l(c)=PDC0(c); pwm.l(c)=pwm0(c); pwe.l(c)=pwe0(c);

EXR.l=EXR0; PEC.l(c)=PEC0(c);

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

YI.l(a)=YI0(a); TYL.l=TYL0; YHK.l=YHK0; YHW.l=YHW0;

YHT.l=YHT0; SH.l=SH0; QH.l(c)=QH0(c);

LHD.l=LHDz;

FTW.l=FTW0;

EH.l=EH0;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

YK.l(a)=YK0(a); TYK.l=TYK0; YWK.l=YWK0; YEK.l=YEK0;

transfrhent.l=transfrhent0; ENTSAV.l=ENTSAV0;

STO.l(a)=STO0(a);

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

ATAX.l(c)=ATAX0(c); MTAX.l(c)=MTAX0(c); HTAX.l =HTAX0;

ENTAX.l=ENTAX0; transfrrg.l=transfrrg0; YG.l=YG0;

transfrhg.l=transfrhg0; transfrhr.l=transfrhr0; GSAV.l=GSAV0;

GD.l(a)=GD0(a); transfrgent.l=transfrgent0; EG.l=EG0;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

EINV.l=EINV0; INV.l(a)=INV0(a); TSAV.l=TSAV0;

RGDP.l=RGDP0; SGDP.l(a)=SGDP0(a); GDP.l=GDP0;

PGDP.l=PGDP0; WALRAS.l=WALRAS0;

QKD.l(a)=QKD0(a);

QLD.l(a)=QLD0(a);

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Model Kamal /all/;

OPTION ITERLIM=4000;

OPTION RESLIM=4000;

OPTION SOLPRINT=OFF;

OPTION DECIMALS=4;

\*OPTION optcr=0;

Kamal.holdfixed=1;

OPTION mcp=path;

Solve Kamal using mcp;

display

YI0,

PL0,

WL0,

QLD0,

wldist,

YK0,

QKD0,

PK0,

WK0,

wrdist,

QX.l, ND.l, UND.l, QA.l, PA.l,

QINT.l, KL.l, QLD.l, QKD.l,

QED.l,

QEEE.l,

Epetr.l, Egas.l, QELE.l,

PX.l, PND.l,

PQINT.l, PKL.l, WL.l, WK.l,

WE.l, PQEEE.l,

Ppetr.l, Pgas.l,

PELE.l,

QQ.l, QDC.l, QM.l, QEC.l,

PQ.l, PDC.l, PWM.l, PWE.l, EXR.l,

YI.l, TYL.l, YHK.l, YHW.l,

YHT.l, SH.l,

EH.l,

LHD.l, QH.l,

YK.l, TYK.l, YWK.l, YEK.l,

transfrhent.l, ENTSAV.l,

STO.l,

ATAX.l, MTAX.l, HTAX.l ,

ENTAX.l, transfrrg.l, YG.l, EG.l,

transfrhg.l, transfrhr.l, GSAV.l, GD.l,

EINV.l, INV.l, TSAV.l,

RGDP.l, SGDP.l, GDP.l, PGDP.l,

\*EV.l,

WALRAS.l,

QPEco2.l, QPEco.l, QPEso2.l, QPEnox.l,

\*TTAX(co2,a).l, TTAX(co,a).l, TTAX(so2,a).l, TTAX(nox,a).l,

HHT.l,

\*QPEco2.l, QPEco.l, QPEso2.l, QPEnox.l,

TAXco2.l, TAXco.l, TAXso2.l, TAXnox.l

\*HHTco2.l, HHTco.l, HHTso2.l, HHTnox.l;

\*tc.l,

execute\_unload "Results.gdx",

QX.l, ND.l, UND.l, QA.l, PA.l,

QINT.l, KL.l, QLD.l, QKD.l,

QED.l,

QEEE.l,

Epetr.l, Egas.l,

QELE.l,

PX.l, PND.l,

PQINT.l, PKL.l, WL.l, WK.l,

WE.l, PQEEE.l,

Ppetr.l,

Pgas.l,

PELE.l,

QQ.l, QDC.l, QM.l, QEC.l,

PQ.l, PDC.l, PWM.l, PWE.l, EXR.l,

YI.l, TYL.l, YHK.l, YHW.l,

YHT.l, SH.l, EH.l, LHD.l, QH.l,

YK.l, TYK.l, YWK.l, YEK.l,

transfrhent.l, ENTSAV.l, STO.l,

ATAX.l, MTAX.l, HTAX.l ,

ENTAX.l, transfrrg.l, YG.l,

transfrhg.l, transfrhr.l, GSAV.l, GD.l,

EINV.l, INV.l, TSAV.l,

RGDP.l, SGDP.l, GDP.l, PGDP.l,

\*EV.l,

WALRAS.l,

QPEco2.l, QPEco.l, QPEso2.l, QPEnox.l,

\*TTAX(co2,a).l, TTAX(co,a).l, TTAX(so2,a).l, TTAX(nox,a).l,

HHT.l,

\*QPEco2.l, QPEco.l, QPEso2.l, QPEnox.l,

TAXco2.l, TAXco.l, TAXso2.l, TAXnox.l

\*HHTco2.l, HHTco.l, HHTso2.l, HHTnox.l

;