



ANARRES_t: Model Setup and Calibration



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Outline

- Global SAM
- Excel database
 - Sets
 - Maps
 - Elasticities
 - Controls
- Model configuration
 - Very small transactions
 - Scaling – ‘automatic’ or manual
 - Controls
 - Applied elasticities
 - Small trade shares



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Global SAM



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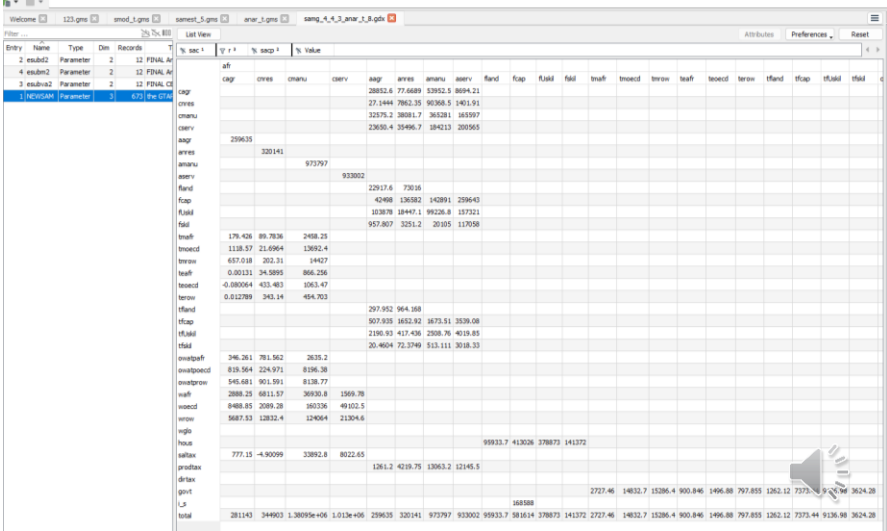
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Global SAM in GDX



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Elasticities in GDX

File View Help

Welcome | 123.gms | smod_t.gms | samest_5.gms | anar_t.gms | samg_4_4_3_anar_t_8.

Filter ...

List View

Entry	Name	Type	Dim	Records	T
2	esubd2	Parameter	2	12	FINAL Ar
4	esubm2	Parameter	2	12	FINAL Ar
3	esubva2	Parameter	2	12	FINAL CE
1	NEWSAM	Parameter	3	673	the GTAP

	c 1	r 2	Value
	afr	oecd	row
cagr	2.30781	2.38539	2.36739
cnres	5.95785	5.9429	5.39722
cmanu	2.99274	3.03788	3.10955
cserv	1.9	1.9	1.9

NB: These elasticities differ by region because the aggregation weights are region specific. In the GTAP model the aggregation weights are global.

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A presentation slide with a white background and a thin black border. In the top-left corner, there is a red rounded rectangle containing the text 'cgemod' in white. The main title 'Excel Database' is centered on the slide in a large, red, italicized serif font. In the bottom-right corner, there is a small grey speaker icon with sound waves. The footer at the very bottom consists of three elements: 'Global CGE, 2025' on the left, '© cgemod' in the center, and the number '6' on the right.

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Sets in Excel

E36fx

	A	B	C	D	E	F	G	H	I	J
1	Sets									
2										
3	New SAM accounts			Regions			Regional Accounts for		Commodities	Agricultural Commodities
4	sac	(description)	r	(description)	ref			c	cagr	
5	oagr	Agriculture	afr	Africa	oecd			oagr	cagr	
6	cnres	Natural Resources	oecd	OECD				cnres		
7	cmanu	Manufacturing	row	Rest of the World				cmanu		
8	cserv	Services	glo	Globe				cserv		
9	aagr	Agriculture								
10	anres	Natural Resources								
11	amanu	Manufacturing								
12	aserv	Services								
13	fland	Land and Natural Resources								
14	fcap	Capital								
15	fUskil	Unskilled labour								
16	fskil	Skilled labour								
17	tmufr	Africa								
18	tmoeed	OECD								
19	tmrow	Rest of the World								
20	tmglo	GLOBE								
21	teufr	Africa								
22	teoeed	OECD								
23	terow	Rest of the World								
24	teglo	GLOBE								
25	tfland	Land and Natural Resources								
26	tfcap	Capital								
27	tfUskil	Unskilled labour								
28	tfiskl	Skilled labour								

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Maps

Maps

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Maps																		
2																			
3																			
4	MAP_W_TMR(w,tmr)	MAP_TMR_w(tm,w)	MAP_W_TER(w,ter)	MAP_TER_W(tm,w)	MAPR_W(r,w)	MAPW_R(w,r)	MAP_F_TFF(f												
5	wufr	tmufr	wufr	tmufr	wufr	tmufr	fland	fland											
6	woecd	tmoeed	woecd	tmoeed	woecd	tmoeed	fcap	fcap											
7	wrow	tmrow	wrow	tmrow	wrow	tmrow	fUskil	fUskil											
8	wglo	tmglo	wglo	tmglo	wglo	tmglo	fskil	fskil											
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Own Elasticities

NB: The numerical values for these elasticities are MEANINGLESS. They are place holders, which users need to adjust if they choose to set the elasticities themselves.

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Controls

Controls

These values are used to initialise various parameters that condition the model and control the operation of the programme

mod_control

mcons

numchek 1 IF 1 then default, if NOT 1 then check on numeraire

mintrans 0.00001 Minimum values for transactions in unscaled SAMG

minapqsh 0.1 Minimum share of intermediates in cost for aqx

samscl 0.001 SAM scaling factor and initial value for autoscaling

scalarg 100 target level for auto scaling

scalprop 0.95 proportion of NON zero elements that must be below the target level

amelast 1 IF 1 then ALL Armington elasticities from Excel; IF 2 ALL from 'GTAP'

amscl 1 Scaling value for GTAP Armington elasticities - divided by amscal

cetelast 1 IF 1 then ALL CET elasticities from Excel; IF 2 ALL from 'GTAP'

cetcal 1 Scaling value for GTAP CET elasticities - divided by cetscal

qvelast 2 IF 1 then ALL Level 1 production elasticities from Excel; IF 2 ALL from 'GTAP'

qvelcal 2 Scaling value for GTAP Level 1 Production elasticities - divided by qvelcal

qvelast 2 IF 1 then ALL Level 2 production elasticities from Excel; IF 2 ALL from 'GTAP'

tolddiffam 0.00001 Tolerance level for differences between data and solution SAMs

smampsh 0.001 Range 0 to 1; IF 1 then NO LARGE shares; IF 0 then NO SMALL shares

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ANARRES_t Elasticities

A	B	C	D	E	F	G	H
1	Model Specific Household Income Elasticities						
2	Elasticities						
3							
4	ELASTY	ELASTY	ELASTY				
5				afr	oecd	row	glo
6	Agriculture	cagr	hous	0.5	1	0.25	1
7	Natural Resources	cnres	hous	0.65	1	0.5	1
8	Manufacturing	cmanu	hous	1.6	1	1.5	1
9	Services	cserv	hous	1.6	1	1.5	1
10							
11							
12							
13							
14							
15							
16							
17							
18							
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30							

NB: The elasticities in the worksheets “actelastx”, “frischelast” and “incelast” must be set by the user – there are no counterpart elasticities in the GTAP database.

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Data Entry

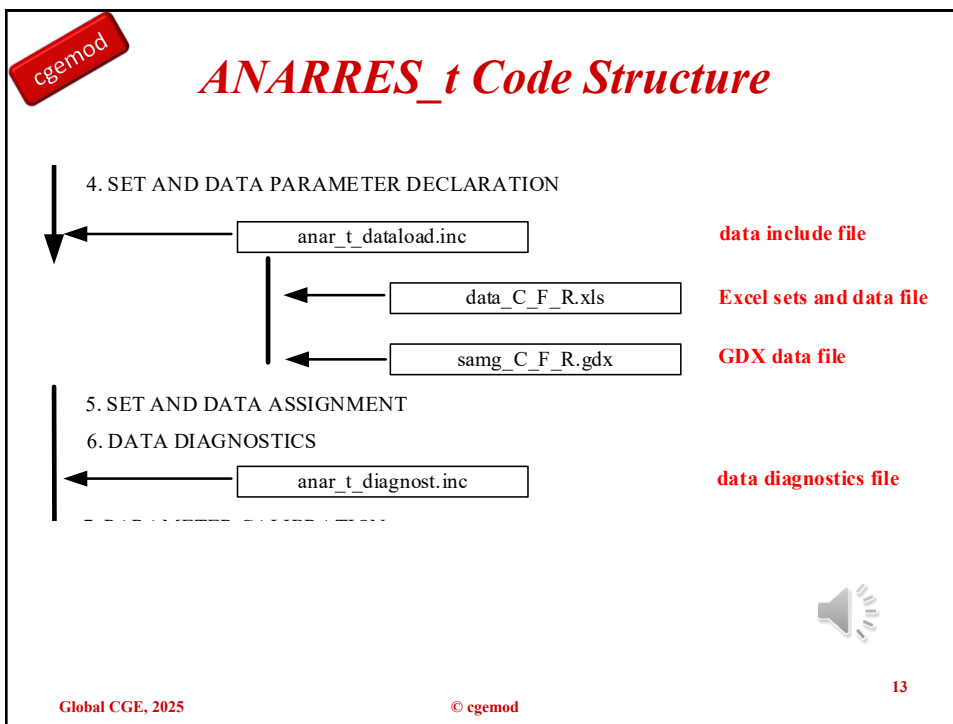
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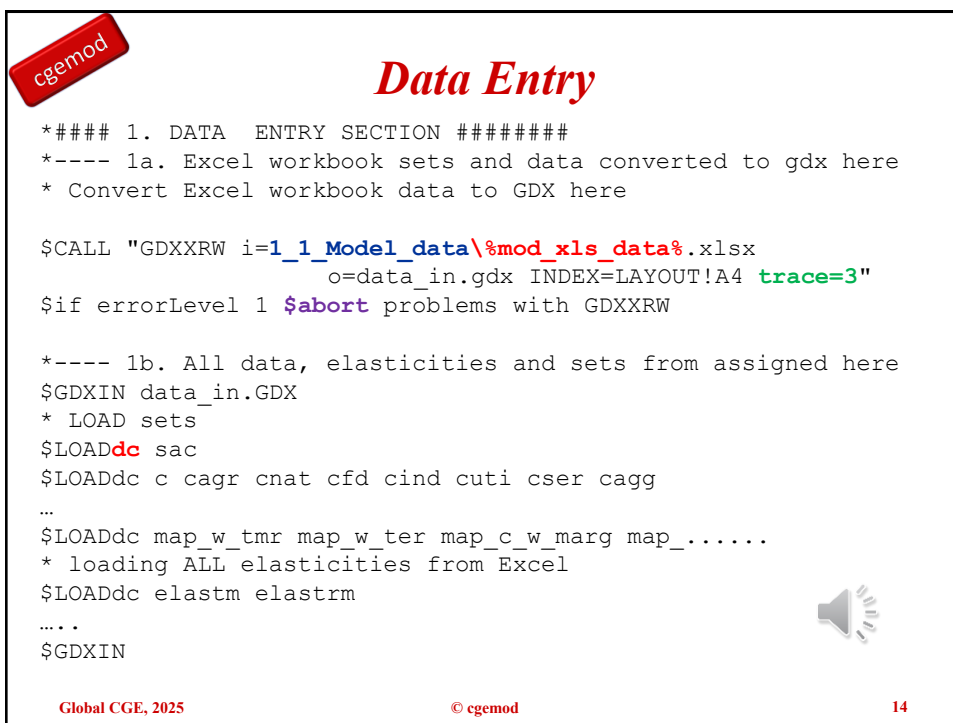
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SAM Data Entry

*---- 1c. All GTAP transactions and elasticity data assigned here

\$ontext

Read in GTAP data and elasticities from GDX file. Data are read for all regions as SAMG. In SAMG(*,*,*), the third index refers to the country SAM however, in the model, parameters, variables, and eqn. that describe bilateral trade, the second index refers to the country and the third index refers to the trade partner.

\$offtext

\$GDXIN 1_1_Model_data\%mod__gdx_data%.gdx

* LOAD transactions/SAMG data

\$LOADdc SAMG = NEWSAM

* Loading GTAP elasticities

\$LOADdc elastmg = esubd2 elastvag = esubva2 elastrmg = esubm2

\$GDXIN

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Model Configuration



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Removing Very Small Transactions

```

##### 2. REMOVING VERY SMALL VALUES FROM SAMG #####

parameter
  cutoff                min value for transactions in unscaled SAMG
  samgbase(sac,sac,r)   base SAMG
  samgdifff(sac,sac,r)  transactions less than cutoff in SAMG ;

  cutoff = mod_cont("mintrans") ;

  samgbase(sac,sacp,r) = samg(sac,sacp,r);
  SAMGdifff(sac,sacp,r)$(ABS(SAMGBASE(sac,sacp,r)) LT 0.0001)
    = SAMGBASE(sac,sacp,r) ;

display samgdifff ;

  samg(sac,sacp,r) = samgbase(sac,sacp,r) - samgdifff(sac,sacp,r) ;

execute_unload 'samgnew2', samg ;

```



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Automatic Scaling

```

##### 3. AUTOMATIC SCALING OF VALUES IN SAMG #####
* Assigning values to initialise scaling parameter

  samscale                = mod_cont("samscale") ;

ABORT $(mod_cont("scaltarg") LE 0.0)
  "mod_cont(scaltarg) less or equal to ZERO - set to +ve value" ;

WHILE (
  ( ( SUM((sacn,sacnp,r)$(SAMG(sacn,sacnp,r)
    AND (ABS(SAMG(sacn,sacnp,r)/samscale) <
      mod_cont("scaltarg"))),1) )
    /SUM((sacn,sacnp,r)$(SAMG(sacn,sacnp,r), 1) )
    < mod_cont("scalprop") ,

  *Samscale increased in multiples of 10 till condition is satisfied
    samscale = samscale * 10 ;

  ) ;

```



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Controls

	A	B	C	D	E
1	Control Parameters				
2	These values are used to initialise various parameters that condition the model and control the operation of the programme				
3					
4					
5	mod_control				
6					
7	mcons				
8	numerchk	1			IF 1 then default, if NOT 1 then check on numeraire
9	mintrans	0.00001			Minimum values for transactions in unscaled SAMG
10	minaqsh	0.1			Minimum share of intermediates in cost for aqx
11	samscl	0.001			SAM scaling factor and initial value for autoscaling
12	scal targ	100			target level for auto scaling
13	scalprop	0.95			proportion of NON zero elements that must be below the target level
14	armelast	2			IF 1 then ALL Armington elasticities from Excel; IF 2 ALL from 'GTAP'
15	armscal	2			Scaling value for GTAP Armington elasticities - divided by armscl
16	cetelast	1			IF 1 then ALL CET elasticities from Excel; IF 2 ALL from 'GTAP'
17	cetscal	1			Scaling value for GTAP CET elasticities - divided by cetscl
18	qxelast	1			IF 1 then ALL Level 1 production elasticities from Excel; IF 2 ALL from 'GTAP'
19	qxscal	2			Scaling value for GTAP Level 1 Production elasticities - divided by qxscal
20	qxaelast	1			IF 1 then ALL Level 2 production elasticities from Excel; IF 2 ALL from 'GTAP'
21	toldiffsam	0.00001			Tolerance level for differences between data and solution SAMs
22	smimpsh	0.001			Range 0 to 1; If 1 then NO LARGE shares; If 0 then NO SMALL shares
23					
24					
25					
26					
27					

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Selecting the Elasticities

```
## Parameters for Armington/CES functions
$ontext
Choice of elasticities for Import substitution
  Selection controlled by value of mod_cont("ceselast")
  a) IF mod_cont("ceselast") = 1
      ALL elasticities for ARMINGTON are from Excel
  b) IF mod_cont("ceselast") = 2
      Elast'ies for ARMINGTON are from Excel - elastmg & elastrmg
$offtext

IF {mod_cont("armelast") = 1,
    mod_elastrm(c,r) = ELASTRM(c,r) ; } ;GTAP

IF {mod_cont("armelast") = 2,

    mod_elastrm(c,r) = ELASTRMG(c,r)/mod_cont("armscal") ;

    mod_elastrm(c,r)$(mod_elastrm(c,r) GT 0.85 and mod_elastrm(c,r) LE 1.0)
    = 0.85 ;
    mod_elastrm(c,r)$(mod_elastrm(c,r) GT 1.0 and mod_elastrm(c,r) LT 1.15)
    = 1.15 ;
} ;
```

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Small Trade Shares

Parameter

```
imprtsh(w,c,r)  import trade shares  ;

imprtsh(w,c,r)$(SUM(wp,SAMG(wp,c,r)))
                = SAMG(w,C,r)/SUM(wp,SAMG(wp,C,r))  ;

cmrs(w,c,r)$(cmr(w,c,r) AND (imprtsh(w,c,r)
                        LT mod_cont("smimpsh")) ) = YES  ;

cmrsn(w,C,r)                                           = NOT cmrs(w,C,r)  ;

cmrl(w,c,r)$(cmr(w,c,r) AND (imprtsh(w,c,r)
                        GE mod_cont("smimpsh")) ) = YES  ;

cmrln(w,C,r)                                           = NOT cmrl(w,C,r)  ;
```



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The End



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