

THE PEP STANDARD
COMPUTABLE GENERAL EQUILIBRIUM MODEL
SINGLE-COUNTRY, RECURSIVE DYNAMIC VERSION
PEP-1-t

VERSION 2.0 ¹

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EQUATIONS, SETS, VARIABLES AND PARAMETERS

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APPENDIX A: EQUATIONS, SETS, VARIABLES AND PARAMETERS

A1. Equations

A1.1 PRODUCTION

1. $VA_{j,t} = v_j XST_{j,t}$
2. $CI_{j,t} = io_j XST_{j,t}$
3. $VA_{j,t} = B_j^{VA} \left[\beta_j^{VA} LDC_{j,t}^{-\rho_j^{VA}} + (1 - \beta_j^{VA}) KDC_{j,t}^{-\rho_j^{VA}} \right]^{\frac{1}{\rho_j^{VA}}}$
4. $LDC_{j,t} = \left[\frac{\beta_j^{VA} RC_{j,t}}{1 - \beta_j^{VA} WC_{j,t}} \right]^{\sigma_j^{VA}} KDC_{j,t}$
5. $LDC_{j,t} = B_j^{LD} \left[\sum_l \beta_{l,j}^{LD} LD_{l,j,t}^{-\rho_j^{LD}} \right]^{\frac{1}{\rho_j^{LD}}}$
6. $LD_{l,j,t} = \left[\frac{\beta_{l,j}^{LD} WC_{j,t}}{WTI_{l,j,t}} \right]^{\sigma_j^{LD}} (B_j^{LD})^{\sigma_j^{LD}-1} LDC_{j,t}$
7. $KDC_{j,t} = B_j^{KD} \left[\sum_k \beta_{k,j}^{KD} KD_{k,j,t}^{-\rho_j^{KD}} \right]^{\frac{1}{\rho_j^{KD}}}$
8. $KD_{k,j,t} = \left[\frac{\beta_{k,j}^{KD} RC_{j,t}}{RTI_{k,j,t}} \right]^{\sigma_j^{KD}} (B_j^{KD})^{\sigma_j^{KD}-1} KDC_{j,t}$
9. $DI_{i,j,t} = aij_{i,j} CI_{j,t}$

A1.2 INCOME AND SAVINGS

A1.2.1 Households

10. $YH_{h,t} = YHL_{h,t} + YHK_{h,t} + YHTR_{h,t}$
11. $YHL_{h,t} = \sum_l \lambda_{h,l}^{WL} \left(W_{l,t} \sum_j LD_{l,j,t} \right)$
12. $YHK_{h,t} = \sum_k \lambda_{h,k}^{RK} \left(\sum_j R_{k,j,t} KD_{k,j,t} \right)$
13. $YHTR_{h,t} = \sum_{ag} TR_{h,ag,t}$
14. $YDH_{h,t} = YH_{h,t} - TDH_{h,t} - TR_{gvt,h,t}$

15. $CTH_{h,t} = YDH_{h,t} - SH_{h,t} - \sum_{agng} TR_{agng,h,t}$
16. $SH_{h,t} = PIXCON_t^\eta sh0_{h,t} + sh1_{h,t} YDH_{h,t}$

A1.2.2 Firms

17. $YF_{f,t} = YFK_{f,t} + YFTR_{f,t}$
18. $YFK_{f,t} = \sum_k \lambda_{f,k}^{RK} \left(\sum_j R_{k,j,t} KD_{k,j,t} \right)$
19. $YFTR_{f,t} = \sum_{ag} TR_{f,ag,t}$
20. $YDF_{f,t} = YF_{f,t} - TDF_{f,t}$
21. $SF_{f,t} = YDF_{f,t} - \sum_{ag} TR_{ag,f,t}$

A1.2.3 Government

22. $YG_t = YGK_t + TDHT_t + TDFT_t + TPROD N_t + TPRCTS_t + YGTR_t$
23. $YGK_t = \sum_k \lambda_{gvt,k}^{RK} \left(\sum_j R_{k,j,t} KD_{k,j,t} \right)$
24. $TDHT_t = \sum_h TDH_{h,t}$
25. $TDFT_t = \sum_f TDF_{f,t}$
26. $TPRODN_t = TIWT_t + TIKT_t + TIPT_t$
27. $TIWT_t = \sum_{l,j} TIW_{l,j,t}$
28. $TIKT_t = \sum_{k,j} TIK_{k,j,t}$
29. $TIPT_t = \sum_j TIP_{j,t}$
30. $TPRCTS_t = TICT_t + TIMT_t + TIXT_t$
31. $TICT_t = \sum_i TIC_{i,t}$
32. $TIMT_t = \sum_i TIM_{i,t}$
33. $TIXT_t = \sum_i TIX_{i,t}$
34. $YGTR_t = \sum_{agng} TR_{gvt,agng,t}$
35. $TDH_{h,t} = PIXCON_t^\eta ttdh0_{h,t} + ttdh1_{h,t} YH_{h,t}$
36. $TDF_{f,t} = PIXCON_t^\eta ttdf0_{f,t} + ttdf1_{f,t} YFK_{f,t}$

37. $TIW_{l,j,t} = ttw_{l,j,t} W_{l,t} LD_{l,j,t}$
38. $TIK_{k,j,t} = ttik_{k,j,t} R_{k,j,t} KD_{k,j,t}$
39. $TIP_{j,t} = ttip_{j,t} PP_{j,t} XST_{j,t}$
40. $TIC_{i,t} = ttic_{i,t} \left[\begin{array}{l} \left(PL_{i,t} + \sum_{ij} PC_{ij,t} tmrg_{ij,i} \right) DD_{i,t} \\ + \left((1 + tim_{i,t}) PWM_{i,t} e_t + \sum_{ij} PC_{ij,t} tmrg_{ij,i} \right) IM_{i,t} \end{array} \right]$
41. $TIM_{i,t} = ttim_{i,t} PWM_{i,t} e_t IM_{i,t}$
42. $TIX_{i,t} = ttix_{i,t} \left(PE_{i,t} + \sum_{ij} PC_{ij,t} tmrg_{ij,i}^X \right) EXD_{i,t}$
43. $SG_t = YG_t - \sum_{agng} TR_{agng,gvt,t} - G_t$

A1.2.4 Rest of the world

44. $YROW_t = e_t \sum_i PWM_{i,t} IM_{i,t} + \sum_k \lambda_{row,k}^{RK} \left(\sum_j R_{k,j,t} KD_{k,j,t} \right) + \sum_{agd} TR_{row,agd,t}$
45. $SROW_t = YROW_t - \sum_i PE_{i,t}^{FOB} EXD_{i,t} - \sum_{agd} TR_{agd,row,t}$
46. $SROW_t = -CAB_t$

A1.2.5 Transfers

47. $TR_{agng,h,t} = \lambda_{agng,h}^{TR} YDH_{h,t}$
48. $TR_{gvt,h,t} = PIXCON_t^\eta tr0_{h,t} + tr1_{h,t} YH_{h,t}$
49. $TR_{ag,f,t} = \lambda_{ag,f}^{TR} YDF_{f,t}$
50. $TR_{agng,gvt,t} = PIXCON_t^\eta TR_{agng,gvt}^O pop_t$
51. $TR_{agd,row,t} = PIXCON_t^\eta TR_{agd,row}^O pop_t$

A1.3 DEMAND

52. $PC_{i,t} C_{i,h,t} = PC_{i,t} C_{i,h,t}^{MIN} + \gamma_{i,h}^{LES} \left(CTH_{h,t} - \sum_{ij} PC_{ij,t} C_{ij,h,t}^{MIN} \right)$
53. $GFCF_t = IT_t - \sum_i PC_{i,t} VSTK_{i,t}$
54. $PC_{i,t} INV_{i,t}^{PRI} = \gamma_i^{INV PRI} IT_t^{PRI}$
55. $PC_{i,t} INV_{i,t}^{PUB} = \gamma_i^{INV PUB} IT_t^{PUB}$
56. $INV_{i,t} = INV_{i,t}^{PRI} + INV_{i,t}^{PUB}$

57. $PC_{i,t} CG_{i,t} = \gamma_i^{GVT} G_t$
58. $DIT_{i,t} = \sum_j DI_{i,j,t}$
59. $MRGN_{i,t} = \sum_{ij} tmrg_{i,ij} DD_{ij,t} + \sum_{ij} tmrg_{i,ij} IM_{ij,t} + \sum_{ij} tmrg_{i,ij}^X EXD_{ij,t}$

A1.4 PRODUCER SUPPLIES OF PRODUCTS AND INTERNATIONAL TRADE

60. $XST_{j,t} = B_j^{XT} \left[\sum_i \beta_{j,i}^{XT} XS_{j,i,t}^{\rho_j^{XT}} \right]^{\frac{1}{\rho_j^{XT}}}$
61. $XS_{j,i,t} = \frac{XST_{j,t}}{(B_j^{XT})^{1+\sigma_j^{XT}}} \left[\frac{P_{j,i,t}}{\beta_{j,i}^{XT} PT_{j,t}} \right]^{\sigma_j^{XT}}$
62. $XS_{j,i,t} = B_{j,i}^X \left[\beta_{j,i}^X EX_{j,i,t}^{\rho_{j,i}^X} + (1 - \beta_{j,i}^X) DS_{j,i,t}^{\rho_{j,i}^X} \right]^{\frac{1}{\rho_{j,i}^X}}$
63. $EX_{j,i,t} = \left[\frac{1 - \beta_{j,i}^X}{\beta_{j,i}^X} \frac{PE_{i,t}}{PL_{i,t}} \right]^{\sigma_{j,i}^X} DS_{j,i,t}$
64. $EXD_{i,t} = EXD_i^O pop_t \left(\frac{e_t PWX_{i,t}}{PE_{i,t}^{FOB}} \right)^{\sigma_i^{XD}}$
65. $Q_{i,t} = B_i^M \left[\beta_i^M IM_{i,t}^{-\rho_i^M} + (1 - \beta_i^M) DD_{i,t}^{-\rho_i^M} \right]^{\frac{-1}{\rho_i^M}}$
66. $IM_{i,t} = \left[\frac{\beta_i^M}{1 - \beta_i^M} \frac{PD_{i,t}}{PM_{i,t}} \right]^{\sigma_i^M} DD_{i,t}$

A1.5 PRICES

A1.5.1 Production

67. $PP_{j,t} = \frac{PVA_{j,t} VA_{j,t} + PCI_{j,t} CI_{j,t}}{XST_{j,t}}$
68. $PT_{j,t} = (1 + ttip_{j,t}) PP_{j,t}$
69. $PCI_{j,t} = \frac{\sum_i PC_{i,t} DI_{i,j,t}}{CI_{j,t}}$
70. $PVA_{j,t} = \frac{WC_{j,t} LDC_{j,t} + RC_{j,t} KDC_{j,t}}{VA_{j,t}}$

$$71. \quad WC_{j,t} = \frac{\sum_l WTI_{l,j,t} LD_{l,j,t}}{LDC_{j,t}} \quad (\text{redundant, given equations 5 and 6; see Appendix E2})$$

$$72. \quad WTI_{l,j,t} = W_{l,t} (1 + ttiw_{l,j,t})$$

$$73. \quad RC_{j,t} = \frac{\sum_k RTI_{k,j,t} KD_{k,j,t}}{KDC_{j,t}} \quad (\text{redundant, given equations 7 and 8; see Appendix E3})$$

$$74. \quad RTI_{k,j,t} = R_{k,j,t} (1 + ttik_{k,j,t})$$

A1.5.2 International trade

$$75. \quad PT_{j,t} = \frac{\sum_i P_{j,i,t} XS_{j,i,t}}{XST_{j,t}} \quad (\text{redundant, given equations 60 and 61; see Appendix E4})$$

$$76. \quad P_{j,i,t} = \frac{PE_{i,t} EX_{j,i,t} + PL_{i,t} DS_{j,i,t}}{XS_{j,i,t}}$$

$$77. \quad PE_{i,t}^{FOB} = \left(PE_{i,t} + \sum_{ij} PC_{ij,t} tmg_{ij,i}^X \right) (1 + ttix_{i,t})$$

$$78. \quad PD_{i,t} = (1 + ttic_{i,t}) \left(PL_{i,t} + \sum_{ij} PC_{ij,t} tmg_{ij,i} \right)$$

$$79. \quad PM_{i,t} = (1 + ttic_{i,t}) \left((1 + tim_{i,t}) e_{i,t} PWM_{i,t} + \sum_{ij} PC_{ij,t} tmg_{ij,i} \right)$$

$$80. \quad PC_{i,t} = \frac{PM_{i,t} IM_{i,t} + PD_{i,t} DD_{i,t}}{Q_{i,t}}$$

A1.5.3 Price indexes

$$81. \quad PIXGDP_t = \sqrt{\frac{\sum_j PVA_{j,t} VA_j^O \sum_j PVA_{j,t} VA_{j,t}}{\sum_j PVA_j^O VA_j^O \sum_j PVA_j^O VA_{j,t}}}$$

$$82. \quad PIXCON_t = \frac{\sum_i PC_{i,t} \sum_h C_{i,h}^O}{\sum_{ij} PC_{ij}^O \sum_h C_{ij,h}^O}$$

$$83. \quad PIXINV_t^{PRI} = \prod_i \left(\frac{PC_{i,t}}{PC_i^O} \right)^{\gamma_i^{INVPRI}}$$

$$84. \quad PIXINV_t^{PUB} = \prod_i \left(\frac{PC_{i,t}}{PC_i^O} \right)^{\gamma_i^{INVPUB}}$$

$$85. \quad PIXGVT_t = \prod_i \left(\frac{PC_{i,t}}{PC_i^0} \right)^{\gamma_i^{GVT}}$$

A1.6 EQUILIBRIUM

$$86. \quad Q_{i,t} = \sum_h C_{i,h,t} + CG_{i,t} + INV_{i,t} + VSTK_{i,t} + DIT_{i,t} + MRGN_{i,t}$$

$$87. \quad \sum_j LD_{l,j,t} = LS_{l,t}$$

$$88. \quad \sum_j KD_{k,j,t} = KS_{k,t}$$

$$89. \quad IT_t = \sum_h SH_{h,t} + \sum_f SF_{f,t} + SG_t + SROW_t$$

$$90. \quad IT_t^{PRI} = IT_t - IT_t^{PUB} - \sum_i PC_{i,t} VSTK_{i,t}$$

$$91. \quad \sum_j DS_{j,i,t} = DD_{i,t}$$

$$92. \quad \sum_j EX_{j,i,t} = EXD_{i,t}$$

A1.7 GROSS DOMESTIC PRODUCT

$$93. \quad GDP_t^{BP} = \sum_j PVA_{j,t} VA_{j,t} + TIPT_t$$

$$94. \quad GDP_t^{MP} = GDP_t^{BP} + TPRCTS_t$$

$$95. \quad GDP_t^{IB} = \sum_{l,j} W_{l,t} LD_{l,j,t} + \sum_{k,j} R_{k,j,t} KD_{k,j,t} + TPROD_t + TPRCTS_t$$

$$96. \quad GDP_t^{FD} = \sum_i PC_{i,t} \left[\sum_h C_{i,h,t} + CG_{i,t} + INV_{i,t} + VSTK_{i,t} \right] \\ + \sum_i PE_{i,t}^{FOB} EXD_{i,t} - \sum_i e_t PWM_{i,t} IM_{i,t}$$

A1.8 DYNAMIC EQUATIONS

$$97. \quad KD_{k,j,t+1} = KD_{k,j,t} (1 - \delta_{k,j}) + IND_{k,j,t}$$

$$98. \quad IT_t^{PUB} = PK_t^{PUB} \sum_{k,pub} IND_{k,pub,t}$$

$$99. \quad IT_t^{PRI} = PK_t^{PRI} \sum_{k,bus} IND_{k,bus,t}$$

$$100. \quad PK_t^{PRI} = \frac{1}{A^{K-PRI}} \prod_i \left[\frac{PC_{i,t}}{\gamma_i^{INVPRI}} \right]^{\gamma_i^{INVPRI}}$$

$$101. \quad PK_t^{PUB} = \frac{1}{A^{K-PUB}} \prod_i \left[\frac{PC_{i,t}}{\gamma_i^{INVPUB}} \right]^{\gamma_i^{INVPUB}}$$

$$102. IND_{k,bus,t} = \phi_{k,bus} \left[\frac{R_{k,bus,t}}{U_{k,bus,t}} \right]^{\sigma_{k,bus}^{INV}} KD_{k,bus,t}$$

$$103. U_{k,bus,t} = PK_t^{PRI} (\delta_{k,bus} + IR_t) \text{ and } U_{k,pub,t} = PK_t^{PUB} (\delta_{k,pub} + IR_t)$$

A2. Sets

A2.1 INDUSTRIES AND COMMODITIES

All industries: $j, jj \in J = \{J_1, \dots, J_j, \dots\}$

All commodities: $i, ij \in I = \{I_1, \dots, I_i, \dots\}$

Public sectors: $pub \in PUB \subset J = \{PUB_1, \dots, PUB_{pub}, \dots\}$

Private sectors: $bus \in BUS \subset J = \{BUS_1, \dots, BUS_{bus}, \dots\}; BUS \cap PUB = \emptyset$

A2.2 PRODUCTION FACTORS

Labor categories: $l \in L = \{L_1, \dots, L_l, \dots\}$

Capital categories: $k \in K = \{K_1, \dots, K_k, \dots\}$

A2.3 AGENTS

All agents: $ag, agj \in AG = H \cup F \cup \{GVT, ROW\} = \{H_1, \dots, H_h, \dots, F_1, \dots, F_f, \dots, GVT, ROW\}$

Household categories: $h, hj \in H \subset AG = \{H_1, \dots, H_h, \dots\}$

Firm categories: $f, fj \in F \subset AG = \{F_1, \dots, F_f, \dots\}$

Non governmental agent:

$agng \in AGNG \subset AG = H \cup F \cup \{ROW\} = \{H_1, \dots, H_h, \dots, F_1, \dots, F_f, \dots, ROW\}$

Domestic agents: $agd \in AGD \subset AG = H \cup F \cup \{GVT\} = \{H_1, \dots, H_h, \dots, F_1, \dots, F_f, \dots, GVT\}$

A2.4 PERIODS

Periods: $t \in T = \{T_1, \dots, T_t, \dots\}$

A3. Variables

NOTE: In what follows, the word "taxes" should be understood as "taxes, minus subsidies".

A3.1 VOLUME VARIABLES

$C_{i,h,t}$	Consumption of commodity i by type h households
$C_{i,h,t}^{MIN}$	Minimum consumption of commodity i by type h households
$CG_{i,t}$	Public consumption of commodity i (volume)
$CI_{j,t}$	Total intermediate consumption of industry j
$DD_{i,t}$	Domestic demand for commodity i produced locally
$DI_{i,j,t}$	Intermediate consumption of commodity i by industry j
$DIT_{i,t}$	Total intermediate demand for commodity i
$DS_{j,i}$	Supply of commodity i by sector j to the domestic market
$EX_{j,i,t}$	Quantity of product i exported by sector j
$EXD_{i,t}$	World demand for exports of product i
$IM_{i,t}$	Quantity of product i imported
$IND_{k,bus,t}$	Volume of new type k capital investment to sector bus
$IND_{k,pub,t}$	Volume of new type k capital investment to sector pub
$INV_{i,t}$	Final demand of commodity i for investment purposes
$INV_{i,t}^{PRI}$	Final demand of commodity i for private investment purposes
$INV_{i,t}^{PUB}$	Final demand of commodity i for public investment purposes
$KD_{k,j,t}$	Demand for type k capital by industry j
$KDC_{j,t}$	Industry j demand for composite capital
$KS_{k,t}$	Supply of type k capital
$LD_{l,j,t}$	Demand for type l labor by industry j
$LDC_{j,t}$	Industry j demand for composite labor
$LS_{l,t}$	Supply of type l labor
$MRGN_{i,t}$	Demand for commodity i as a trade or transport margin
$Q_{i,t}$	Quantity demanded of composite commodity i
$VA_{j,t}$	Value added of industry j
$VSTK_{i,t}$	Inventory change of commodity i
$XS_{j,i,t}$	Industry j production of commodity i
$XST_{j,t}$	Total aggregate output of industry j

A3.2 PRICE VARIABLES

e_t :	Exchange rate ⁶ : price of foreign currency in terms of local currency
IR_t :	Interest rate
$P_{j,i,t}$:	Basic price of industry j 's production of commodity i
$PC_{i,t}$:	Purchaser price of composite commodity i (including all taxes and margins)
$PCI_{j,t}$:	Intermediate consumption price index of industry j
$PD_{i,t}$:	Price of local product i sold on the domestic market (including all taxes and margins)
$PE_{i,t}$:	Price received for exported commodity i (excluding export taxes)
$PE_{i,t}^{FOB}$:	FOB price of exported commodity i (in local currency)
$PIXCON_t$:	Consumer price index
$PIXGDP_t$:	GDP deflator
$PIXGVT_t$:	Public expenditures price index
$PIXINV_t^{PRI}$:	Private investment price index
$PIXINV_t^{PUB}$:	Public investment price index
PK_t^{PRI} :	Price of new private capital
PK_t^{PUB} :	Price of new public capital
$PL_{i,t}$:	Price of local product i (excluding all taxes on products)
$PM_{i,t}$:	Price of imported product i (including all taxes and tariffs)
$PP_{j,t}$:	Industry j unit cost, including taxes directly related to the use of capital and labor, but excluding other taxes on production
PT_j :	Basic price of industry j 's output
$PVA_{j,t}$:	Price of industry j value added (including taxes on production directly related to the use of capital and labor)
$PWM_{i,t}$:	World price of imported product i (expressed in foreign currency)
$PWX_{i,t}$:	World price of exported product i (expressed in foreign currency)
$R_{k,j,t}$:	Rental rate of type k capital in industry j
$RC_{j,t}$:	Rental rate of industry j composite capital
$RTI_{k,j,t}$:	Rental rate paid by industry j for type k capital, including capital taxes

⁶ The default choice of numeraire in PEP-1-t is the exchange rate e . This is implemented by fixing the value of e as exogenous. But the choice of numeraire in a CGE model is arbitrary (although the interpretation of results can be more or less easy, depending on which numeraire is selected).

$U_{k,j,t}$:	User cost of type k capital in industry j
$W_{l,t}$:	Wage rate of type l labor
$WC_{j,t}$:	Wage rate of industry j composite labor
$WTI_{l,j,t}$:	Wage rate paid by industry j for type l labor, including payroll taxes

A3.3 NOMINAL (VALUE) VARIABLES

CAB_t :	Current account balance
$CTH_{h,t}$:	Consumption budget of type h households
G_t :	Current government expenditures on goods and services
GDP_t^{BP} :	GDP at basic prices
GDP_t^{FD} :	GDP at purchasers' prices from the perspective of final demand
GDP_t^{IB} :	GDP at market prices (income-based)
GDP_t^{MP} :	GDP at market prices
$GFCF_t$:	Gross fixed capital formation
IT_t :	Total investment expenditures
IT_t^{PRI} :	Total private investment expenditures
IT_t^{PUB} :	Total public investment expenditures
$SF_{f,t}$:	Savings of type f businesses
SG_t :	Government savings
$SH_{h,t}$:	Savings of type h households
$SROW_t$:	Rest-of-the-world savings
$TDF_{f,t}$:	Income taxes of type f businesses
$TDFT_t$:	Total government revenue from business income taxes
$TDH_{h,t}$:	Income taxes of type h households
$TDHT_t$:	Total government revenue from household income taxes
$TIC_{i,t}$:	Government revenue from indirect taxes on product i
$TICT_t$:	Total government receipts of indirect taxes on commodities
$TIK_{k,j,t}$:	Government revenue from taxes on type k capital used by industry j
$TIKT_t$:	Total government revenue from taxes on capital
$TIM_{i,t}$:	Government revenue from import duties on product i
$TIMT_t$:	Total government revenue from import duties

$TIP_{j,t}$:	Government revenue from taxes on industry j production (excluding taxes directly related to the use of capital and labor)
$TIPT_t$:	Total government revenue from production taxes (excluding taxes directly related to the use of capital and labor)
$TIW_{l,j,t}$:	Government revenue from payroll taxes on type l labor in industry j
$TIWT_t$:	Total government revenue from payroll taxes
$TIX_{i,t}$:	Government revenue from export taxes on product i
$TIXT_t$:	Total government revenue from export taxes
$TPRCTS_t$:	Total government revenue from taxes on products and imports
$TPRODN_t$:	Total government revenue from other taxes on production ⁷
$TR_{ag,agj,t}$:	Transfers from agent agj to agent ag
$YDF_{f,t}$:	Disposable income of type f businesses
$YDH_{h,t}$:	Disposable income of type h households
$YF_{f,t}$:	Total income of type f businesses
$YFK_{f,t}$:	Capital income of type f businesses
$YFTR_{f,t}$:	Transfer income of type f businesses
YG_t :	Total government income
YGK_t :	Government capital income
$YGTR_t$:	Government transfer income
$YH_{h,t}$:	Total income of type h households
$YHK_{h,t}$:	Capital income of type h households
$YHL_{h,t}$:	Labor income of type h households
$YHTR_{h,t}$:	Transfer income of type h households
$YROW_t$:	Rest-of-the-world income

A3.4 RATES AND INTERCEPTS

$sh0_{h,t}$:	Intercept (type h household savings)
$sh1_{h,t}$:	Slope (type h household savings)
$tr0_{h,t}$:	Intercept (transfers by type h households to government)
$tr1_{h,t}$:	Marginal rate of transfers by type h households to government
$ttdf0_{f,t}$:	Intercept (income taxes of type f businesses)

⁷ That is, taxes on production other than taxes on products and taxes and duties on imports (see Appendix B1).

$ttdf1_{f,t}$: Marginal income tax rate of type f businesses
$ttdh0_{h,t}$: Intercept (income taxes of type h households)
$ttdh1_{h,t}$: Marginal income tax rate of type h households
$ttic_{i,t}$: Tax rate on commodity i
$ttik_{k,j,t}$: Tax rate on type k capital used in industry j
$ttim_{i,t}$: Rate of taxes and duties on imports of commodity i
$ttip_{j,t}$: Tax rate on the production of industry j
$ttiwl_{l,j,t}$: Tax rate on type l worker compensation in industry j
$ttix_{i,t}$: Export tax rate on exported commodity i

A4. Parameters

A^{K-PRI}	: Scale parameter (price of new private capital)
A^{K-PUB}	: Scale parameter (price of new public capital)
$aij_{i,j}$: Input-output coefficient
B_j^{KD}	: Scale parameter (CES – composite capital)
B_j^{LD}	: Scale parameter (CES – composite labor)
B_i^M	: Scale parameter (CES – composite commodity)
B_j^{VA}	: Scale parameter (CES – value added)
$B_{j,i}^X$: Scale parameter (CET – exports and local sales)
B_j^{XT}	: Scale parameter (CET – total output)
$\beta_{k,j}^{KD}$: Share parameter (CES – composite capital)
$\beta_{l,j}^{LD}$: Share parameter (CES – composite labor)
β_i^M	: Share parameter (CES – composite commodity)
β_j^{VA}	: Share parameter (CES – value added)
$\beta_{j,i}^X$: Share parameter (CET – exports and local sales)
$\beta_{j,i}^{XT}$: Share parameter (CET – total output)
$\delta_{k,j}$: Depreciation rate of capital k used in industry j
η	: Price elasticity of indexed transfers and parameters
γ_i^{GVT}	: Share of commodity i in total current public expenditures on goods and services
γ_i^{INVPR}	: Share of commodity i in total private investment expenditure
γ_i^{INVPUB}	: Share of commodity i in total public investment expenditure

$\gamma_{i,h}^{LES}$:	Marginal share of commodity i in type h household consumption budget
io_j :	Coefficient (Leontief – intermediate consumption)
$\lambda_{ag,k}^{RK}$:	Share of type k capital income received by agent ag
$\lambda_{ag,agj}^{TR}$:	Share parameter (transfer functions)
$\lambda_{h,l}^{WL}$:	Share of type l labor income received by type h households
n_t :	Population growth rate
$\phi_{k,j}$:	Scale parameter (allocation of investment to industries)
pop_t :	Population index
ρ_j^{KD} :	Elasticity parameter (CES – composite capital); $-1 < \rho_j^{KD} < \infty$
ρ_j^{LD} :	Elasticity parameter (CES – composite labor); $-1 < \rho_j^{LD} < \infty$
ρ_i^M :	Elasticity parameter (CES – composite commodity); $-1 < \rho_i^M < \infty$
ρ_j^{VA} :	Elasticity parameter (CES – value added) ; $-1 < \rho_j^{VA} < \infty$
$\rho_{j,i}^X$:	Elasticity parameter (CET – exports and local sales) ; $1 < \rho_{j,i}^X < \infty$
ρ_j^{XT} :	Elasticity parameter (CET – total output) ; $1 < \rho_j^{XT} < \infty$
$\sigma_{k,bus}^{INV}$:	Elasticity of private investment demand relative to Tobin's q
σ_j^{KD} :	Elasticity of substitution (CES – composite capital); $0 < \sigma_j^{KD} < \infty$
σ_j^{LD} :	Elasticity of substitution (CES – composite labor); $0 < \sigma_j^{LD} < \infty$
σ_i^M :	Elasticity of substitution (CES – composite commodity); $0 < \sigma_i^M < \infty$
σ_j^{VA} :	Elasticity of transformation (CES – value added) ; $0 < \sigma_j^{VA} < \infty$
$\sigma_{j,i}^X$:	Elasticity of transformation (CET – exports and local sales) ; $0 < \sigma_{j,i}^X < \infty$
σ_i^{XD} :	Price elasticity of the world demand for exports of product i
σ_j^{XT} :	Elasticity of transformation (CET – total output) ; $0 < \sigma_j^{XT} < \infty$
$tmrg_{i,ij}$:	Rate of margin i applied to commodity ij
$tmrg_{i,ij}^X$:	Rate of margin i applied to exported commodity ij
v_j :	Coefficient (Leontief – value added)