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(I-O) - ( (ECGE)

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<sup>1</sup> -Input – Output (I-O)  
<sup>2</sup> - Energy Computable General Equilibrium (ECGE)

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(Social Benefits)

( (Social Insurance Benefits) (

.(Social Assistance Benefits)

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GDP

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ECGE I-O

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⌈ -Use Matrix  
⋈ -Make Matrix  
° -Pure Matrix

$$\begin{aligned}
& : ( \quad ) \\
& i \quad = i \quad + ( \quad ) i \\
& \quad + i \quad ( \quad ) \quad + i \\
& i \quad = i \quad + i \\
& i \quad = i \quad + i \quad ( \quad ) \quad + i \\
& : ( \quad ) \\
& i \quad = ( \quad ) \quad + \\
& \quad + \quad + ( \quad ) \\
& i \quad = i \quad + ( \quad i \quad ) \\
& \quad + \\
& :
\end{aligned}$$

$$P = A'P + V \quad ( )$$

$$(i = 1, \dots, n) \quad i \quad a_{ij} \quad (n \times n) \quad : A$$

$$(j = 1, \dots, n) \quad j$$

: P

: A'

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I-O

I-O

I-O

:  $V$

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:

$$P = (I - A')^{-1} V$$

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(A )

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$$\Delta P = (I - A')^{-1} \Delta V$$

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:  $\Delta P$

:  $\Delta V$

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(PI)

$$\Delta PI = \sum W_i * \Delta P_i \quad ( )$$

$i$  (',n) :  $W_i$

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$$\begin{bmatrix} P_e \\ P_n \end{bmatrix} = \begin{bmatrix} A'_{ee} & A'_{en} \\ A'_{ne} & A'_{nn} \end{bmatrix} * \begin{bmatrix} P_e \\ P_n \end{bmatrix} + \begin{bmatrix} V_e \\ V_n \end{bmatrix} \quad ( )$$

(  $m$ ) (  $m, ')$  :  $P_e$

(  $n - m, ')$  :  $P_n$

(  $m, ')$  :  $V_e$

(  $n - m, ')$  :  $V_n$

(  $m, m$ ) :  $A_{ee}$

(  $m, n - m$ ) :  $A_{en}$

(  $n - m, m$ ) :  $A_{ne}$

(  $n - m, n - m$ ) :  $A_{nn}$

: ( )

$$P_n = A'_{ne} * P_e + A'_{nn} * P_n + V_n \quad ( )$$

$$(I - A'_{nn})P_n = A'_{ne} * P_e + V_n \quad ( )$$

$$P_n = [I - A'_{nn}]^{-1} A'_{ne} P_e + [I - A'_{nn}]^{-1} V_n \quad ( )$$

:

$$\Delta P_n = [I - A'_{nn}]^{-1} A'_{ne} \Delta P_e \quad ( )$$

(ΔP<sub>n</sub>) ( )

(A'\_{ne})

(ΔP<sub>e</sub>)

(A'\_{nn})

(W<sup>n</sup><sub>i</sub>) (W<sup>e</sup><sub>i</sub>)

( )

: (ΔPI)

$$\Delta PI = \sum W^n_i \Delta P^n_i + \sum W^e_i \Delta P^e_i \quad ( )$$

(ΔP<sup>e</sup><sub>i</sub>)

( )

(ΔW<sup>e</sup><sub>i</sub>)

(ΔP<sup>n</sup><sub>i</sub>)

( )

(ΔW<sup>n</sup><sub>i</sub>)

(ECGE)

(ECGE)

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(A) ( - )

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(P)

(EP)

$$\begin{bmatrix} a_{11} & a_{12} & \dots & a_{1\lambda} \\ a_{21} & a_{22} & \dots & a_{2\lambda} \\ a_{r1} & a_{r2} & \dots & a_{r\lambda} \\ a_{\xi 1} & a_{\xi 2} & \dots & a_{\xi \lambda} \end{bmatrix} * \begin{bmatrix} P_1 \\ P_2 \\ \dots \\ P_\lambda \end{bmatrix} = \begin{bmatrix} EP_1 \\ EP_2 \\ EP_r \\ EP_\xi \end{bmatrix}$$

$$A_{(\xi*\lambda)} * P_{(\lambda*)} = EP_{(\xi*)} \quad ( )$$

B ( )

(EP) (KP) (LP)

(PF)

$$\begin{array}{c}
 \left[ \begin{array}{ccc} \beta_{\gamma_1} & \beta_{\gamma_2} & \beta_{\gamma_3} \\ \dots & \dots & \dots \\ \beta_{\gamma_i} & \beta_{\gamma_j} & \beta_{\gamma_k} \end{array} \right] * \left[ \begin{array}{cccc} EP_1 & EP_2 & EP_3 & EP_i \\ LP_1 & LP_2 & LP_3 & LP_i \\ KP_1 & KP_2 & KP_3 & KP_i \end{array} \right] = \left[ \begin{array}{cccc} PP_1 & & & \\ & PP_2 & & \\ & & PP_3 & \\ & & & PP_i \end{array} \right] \\
 \longrightarrow B \longleftarrow \quad \longrightarrow PF \longleftarrow \quad \longrightarrow PP \longleftarrow
 \end{array}$$

$$B_{(\gamma_i)} * PF_{(\gamma_i)} = PP_{(\gamma_i)} \quad ( )$$

(PP)

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(PP )

(\gamma)

$$PPI = \sum \gamma_i * PP_i \quad (\sum \gamma_i = 1) \quad ( )$$

(A)

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(B)

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GDP

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PPI

(LP,KP)

(PPI)

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$$PI = \sum \theta_i * PP_i$$

$$(\sum \theta_i = 1)$$

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ECGE I-O

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(Middle East Economic Survey (MEES))

I-O          ECGE

ECGE

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$$x = \left( \left( \frac{A_n}{A} \right)^{\frac{1}{n}} - 1 \right) * 1 \dots * \dots$$

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