

Generated on 2023-01-18 17:28:29 by gEcon version 1.2.1 (2023-01-18)  
Model name: cge\_DAS

## Index sets

$$HHD = \{01, 02, 03, 04, 05, 06, 07, 08, 09, 10\}$$

$$ROW = \{eu, neu\}$$

$$SEC = \{A, B, C, D, E, F, G, H, I, J, K\}$$

$h \in HHD$

problem

$$\max_{S^{(h)}, L^{(h)}, K^{(h)}, BTINC^{(h)}, INC^{(h)}, PIT^{base^{(h)}}, SAV^{(h)}, THBANK^{(h)}, (THROW^{(h,r)})_{r \in ROW}, TRAN^{(h)}} U^{(h)} = \left( \alpha^{u^{(h)}} DEM^{(h)} \omega^{u^{(h)}-1} (-1+\omega^{u^{(h)}}) + (1 - \alpha^{u^{(h)}}) LEIS^{(h)} \omega^{u^{(h)}-1} (-1+\omega^{u^{(h)}}) \right)^{\omega^{u^{(h)}} (-1+\omega^{u^{(h)}})^{-1}} \quad (1.1)$$

$$e^{(h)} \left( \lambda^{CONSUMER^1(h)} \right) \quad (1.2)$$

$$\left( \lambda^{CONSUMER^2(h)} \right) \quad (1.3)$$

$$D^{(s,h)} D^{(s,h) \omega^{-1}(-1+\omega)} \left( \lambda^{CONSUMER^3(h)} \right)^{\omega(-1+\omega)^{-1}} \quad (1.4)$$

$$+ \sum_{s \in SEC} p^{cons(s)} D^{(s,h)} \left( \lambda^{CONSUMER^4(h)} \right) \quad (1.5)$$

$$PIT^{base^{(h)}} \left( \lambda^{CONSUMER^5(h)} \right) \quad (1.6)$$

$$C^{(h)} - \alpha p^1 L^{(h)} \left( \lambda^{CONSUMER^6(h)} \right) \quad (1.7)$$

$$K^{(h)} + p^1 L^{(h)} \left( \lambda^{CONSUMER^7(h)} \right) \quad (1.8)$$

$$\left( \lambda^{CONSUMER^8(h)} \right) \quad (1.9)$$

$$CONSUMER^9(h) \quad (1.10)$$

$$\left( \lambda^{CONSUMER^{10}(h)} \right) \quad (1.11)$$

$$r^{(h,r)} = \alpha th^{r^{(h,r)}} INC^{(h)} \left( \lambda^{CONSUMER^{11}(h,r)} \right) \quad (1.12)$$

$$\sum_{r \in ROW} ex^{rate(r)} THROW^{(h,r)} \left( \lambda^{CONSUMER^{12}(h)} \right) \quad (1.13)$$

## 1.2 Identities

$$TINSTH^{(h)} = TBANKH^{(h)} + TFIRMH^{(h)} + TGOVH^{(h)} + \sum_{r \in ROW} TROWH^{(r,h)} \quad (1.14)$$

## 1.3 First order conditions

$$s \in SEC: \quad \lambda^{CONSUMER4^{(h)}} p^{cons^{(s)}} + \alpha^{(s,h)} \theta^{dem^{(h)}} \lambda^{CONSUMER3^{(h)}} D^{(s,h)^{-1+\omega^{-1}(-1+\omega)}} \left( \sum_{s \in SEC} \alpha^{(s,h)} D^{(s,h)\omega^{-1}(-1+\omega)} \right)^{-1+\omega(-1+\omega)^{-1}} = 0 \quad (D^{(s,h)}) \quad (1.15)$$

$$-\lambda^{CONSUMER3^{(h)}} + \alpha^{u^{(h)}} DEM^{(h)^{-1+\omega^u^{(h)}(-1+\omega^u^{(h)})} \left( \alpha^{u^{(h)}} DEM^{(h)\omega^u^{(h)}(-1+\omega^u^{(h)})} + (1 - \alpha^{u^{(h)}}) LEIS^{(h)\omega^u^{(h)}(-1+\omega^u^{(h)})} \right)^{-1+\omega^u^{(h)}(-1+\omega^u^{(h)})^{-1}} = 0 \quad (DEM^{(h)}) \quad (1.16)$$

$$-\lambda^{CONSUMER2^{(h)}} - scale^{(h)} \lambda^{CONSUMER1^{(h)}} = 0 \quad (LL^{(h)}) \quad (1.17)$$

$$-scale^{(h)} \lambda^{CONSUMER1^{(h)}} + (1 - \alpha^{u^{(h)}}) LEIS^{(h)^{-1+\omega^u^{(h)}(-1+\omega^u^{(h)})} \left( \alpha^{u^{(h)}} DEM^{(h)\omega^u^{(h)}(-1+\omega^u^{(h)})} + (1 - \alpha^{u^{(h)}}) LEIS^{(h)\omega^u^{(h)}(-1+\omega^u^{(h)})} \right)^{-1+\omega^u^{(h)}(-1+\omega^u^{(h)})^{-1}} = 0 \quad (LEIS^{(h)}) \quad (1.18)$$

$$\lambda^{CONSUMER2^{(h)}} + p^l \lambda^{CONSUMER7^{(h)}} - \alpha p^l \lambda^{CONSUMER6^{(h)}} = 0 \quad (L^{(h)}) \quad (1.19)$$

$$p^k \lambda^{CONSUMER7^{(h)}} - scale^{(h)} \lambda^{CONSUMER8^{(h)}} = 0 \quad (K^{(h)}) \quad (1.20)$$

$$\lambda^{CONSUMER5^{(h)}} + \lambda^{CONSUMER6^{(h)}} - \lambda^{CONSUMER7^{(h)}} = 0 \quad (BTINC^{(h)}) \quad (1.21)$$

$$-\lambda^{CONSUMER4^{(h)}} - \lambda^{CONSUMER5^{(h)}} + \alpha h^b \lambda^{CONSUMER10^{(h)}} + sw^{(h)} \lambda^{CONSUMER9^{(h)}} + \sum_{r \in ROW} \alpha h^r \lambda^{CONSUMER11^{(h,r)}} = 0 \quad (INC^{(h)}) \quad (1.22)$$

$$-\lambda^{CONSUMER6^{(h)}} - \pi^{tax^{(h)}} \lambda^{CONSUMER5^{(h)}} = 0 \quad (PII^{base^{(h)}}) \quad (1.23)$$

$$\lambda^{CONSUMER4^{(h)}} - \lambda^{CONSUMER9^{(h)}} = 0 \quad (SAV^{(h)}) \quad (1.24)$$

$$-\lambda^{CONSUMER10^{(h)}} + \lambda^{CONSUMER12^{(h)}} = 0 \quad (THBANK^{(h)}) \quad (1.25)$$

$$r \in ROW: \quad ex^{rate^{(r)}} \lambda^{CONSUMER12^{(h)}} - ex^{rate^{(r)}} \lambda^{CONSUMER11^{(h,r)}} = 0 \quad (THROW^{(h,r)}) \quad (1.26)$$

$$\lambda^{CONSUMER4^{(h)}} - \lambda^{CONSUMER12^{(h)}} = 0 \quad (TRAN^{(h)}) \quad (1.27)$$

## 1.4 First order conditions after reduction

$$s \in SEC: \quad \lambda^{\text{CONSUMER}^{12}\langle h \rangle} p^{\text{cons}\langle s \rangle} + \alpha^{\langle s, h \rangle} \alpha^{u\langle h \rangle} \theta^{\text{dem}\langle h \rangle} D^{\langle s, h \rangle -1 + \omega^{-1}(-1 + \omega)} DEM^{\langle h \rangle -1 + \omega^u\langle h \rangle -1(-1 + \omega^u\langle h \rangle)} \left( \alpha^{u\langle h \rangle} DEM^{\langle h \rangle \omega^u\langle h \rangle -1(-1 + \omega^u\langle h \rangle)} + (1 - \alpha^{u\langle h \rangle}) LEIS^{\langle h \rangle \omega^u\langle h \rangle -1(-1 + \omega^u\langle h \rangle)} \right) \quad (1.28)$$

$$-scale^{\langle h \rangle} \lambda^{\text{CONSUMER}^1\langle h \rangle} + (1 - \alpha^{u\langle h \rangle}) LEIS^{\langle h \rangle -1 + \omega^u\langle h \rangle -1(-1 + \omega^u\langle h \rangle)} \left( \alpha^{u\langle h \rangle} DEM^{\langle h \rangle \omega^u\langle h \rangle -1(-1 + \omega^u\langle h \rangle)} + (1 - \alpha^{u\langle h \rangle}) LEIS^{\langle h \rangle \omega^u\langle h \rangle -1(-1 + \omega^u\langle h \rangle)} \right)^{-1 + \omega^u\langle h \rangle(-1 + \omega^u\langle h \rangle)^{-1}} = 0 \quad (LEIS^{\langle h \rangle}) \quad (1.29)$$

$$-scale^{\langle h \rangle} \lambda^{\text{CONSUMER}^1\langle h \rangle} + p^1 \left( -\lambda^{\text{CONSUMER}^{12}\langle h \rangle} + \alpha u h^b\langle h \rangle \lambda^{\text{CONSUMER}^{12}\langle h \rangle} - \text{pit}^{\text{tax}\langle h \rangle} \left( -\lambda^{\text{CONSUMER}^{12}\langle h \rangle} + \alpha u h^b\langle h \rangle \lambda^{\text{CONSUMER}^{12}\langle h \rangle} + \text{sw}^{\langle h \rangle} \lambda^{\text{CONSUMER}^{12}\langle h \rangle} + \sum_{r \in ROW} \alpha u h^{r\langle h, r \rangle} \lambda^{\text{CONSUMER}^{12}\langle h, r \rangle} \right) \right) \quad (1.30)$$

$$p^k \left( -\lambda^{\text{CONSUMER}^{12}\langle h \rangle} + \alpha u h^b\langle h \rangle \lambda^{\text{CONSUMER}^{12}\langle h \rangle} - \text{pit}^{\text{tax}\langle h \rangle} \left( -\lambda^{\text{CONSUMER}^{12}\langle h \rangle} + \alpha u h^b\langle h \rangle \lambda^{\text{CONSUMER}^{12}\langle h \rangle} + \text{sw}^{\langle h \rangle} \lambda^{\text{CONSUMER}^{12}\langle h \rangle} + \sum_{r \in ROW} \alpha u h^{r\langle h, r \rangle} \lambda^{\text{CONSUMER}^{11}\langle h, r \rangle} \right) + \text{sw}^{\langle h \rangle} \lambda^{\text{CONSUMER}^{12}\langle h \rangle} \right) \quad (1.31)$$

$$r \in ROW: \quad ex^{\text{rate}\langle r \rangle} \lambda^{\text{CONSUMER}^{12}\langle h \rangle} - ex^{\text{rate}\langle r \rangle} \lambda^{\text{CONSUMER}^{11}\langle h, r \rangle} = 0 \quad \left( \left( \text{THROW}^{\langle h, r \rangle} \right)_{r \in ROW} \right) \quad (1.32)$$

## 2 PRODUCTION OF GOODS $s \in SEC$

### 2.1 Optimisation problem

$$\max_{Y^{\langle s \rangle}, K^{\langle s \rangle}, L^{\langle s \rangle}, Y^{\text{VA}\langle s \rangle}, Y^{\text{INT}\langle s \rangle}, (X^{\langle \tilde{s}, s \rangle})_{\tilde{s} \in SEC}} \pi^{\langle s \rangle} = p^{\langle s \rangle} Y^{\langle s \rangle} - \left( 1 - \text{sub}^{\text{rate}\langle s \rangle} + \text{tax}^{\text{rate}\langle s \rangle} \right) \left( p^k K^{\langle s \rangle} (1 + k^{\text{tax}}) + p^1 L^{\langle s \rangle} (1 + l^{\text{tax}}) + \sum_{\tilde{s} \in SEC} p^{\text{int}\langle \tilde{s} \rangle} X^{\langle \tilde{s}, s \rangle} \right) \quad (2.1)$$

s.t. :

$$Y^{\langle s \rangle} = Y^{\text{VA}\langle s \rangle} \left( \lambda^{\text{PRODUCTION OF GOODS}^1\langle s \rangle} \right) \quad (2.2)$$

$$Y^{\text{VA}\langle s \rangle} = Y^{\text{INT}\langle s \rangle} \left( \lambda^{\text{PRODUCTION OF GOODS}^2\langle s \rangle} \right) \quad (2.3)$$

$$Y^{\text{VA}\langle s \rangle} = \gamma^{\text{yva}\langle s \rangle} K^{\langle s \rangle \beta^k\langle s \rangle} L^{\langle s \rangle \beta^l\langle s \rangle} \left( \lambda^{\text{PRODUCTION OF GOODS}^3\langle s \rangle} \right) \quad (2.4)$$

$$\tilde{s} \in SEC: \quad X^{\langle \tilde{s}, s \rangle} = \beta^x\langle \tilde{s}, s \rangle Y^{\text{INT}\langle s \rangle} \left( \lambda^{\text{PRODUCTION OF GOODS}^4\langle s, \tilde{s} \rangle} \right) \quad (2.5)$$

## 2.2 First order conditions

$$-\lambda^{\text{PRODUCTION OF GOODS}^1(s)} + p^{(s)} = 0 \quad \left( Y^{(s)} \right) \quad (2.6)$$

$$-p^k (1 + k^{\text{tax}}) \left( 1 - \text{sub}^{\text{rate}(s)} + \text{tax}^{\text{rate}(s)} \right) + \beta^{k(s)} \gamma^{\text{yva}(s)} \lambda^{\text{PRODUCTION OF GOODS}^3(s)} K^{(s)-1+\beta^{k(s)}} L^{(s)\beta^{1(s)}} = 0 \quad \left( K^{(s)} \right) \quad (2.7)$$

$$-p^l (1 + l^{\text{tax}}) \left( 1 - \text{sub}^{\text{rate}(s)} + \text{tax}^{\text{rate}(s)} \right) + \beta^{l(s)} \gamma^{\text{yva}(s)} \lambda^{\text{PRODUCTION OF GOODS}^3(s)} K^{(s)\beta^{k(s)}} L^{(s)-1+\beta^{1(s)}} = 0 \quad \left( L^{(s)} \right) \quad (2.8)$$

$$\lambda^{\text{PRODUCTION OF GOODS}^1(s)} - \lambda^{\text{PRODUCTION OF GOODS}^2(s)} - \lambda^{\text{PRODUCTION OF GOODS}^3(s)} = 0 \quad \left( Y^{\text{VA}(s)} \right) \quad (2.9)$$

$$\lambda^{\text{PRODUCTION OF GOODS}^2(s)} + \sum_{\dot{s} \in \text{SEC}} \beta^{x(\dot{s},s)} \lambda^{\text{PRODUCTION OF GOODS}^4(s,\dot{s})} = 0 \quad \left( Y^{\text{INT}(s)} \right) \quad (2.10)$$

$$\dot{s} \in \text{SEC}: \quad -\lambda^{\text{PRODUCTION OF GOODS}^4(s,\dot{s})} - p^{\text{int}(\dot{s})} \left( 1 - \text{sub}^{\text{rate}(s)} + \text{tax}^{\text{rate}(s)} \right) = 0 \quad \left( X^{(\dot{s},s)} \right) \quad (2.11)$$

## 2.3 First order conditions after reduction

$$-p^k (1 + k^{\text{tax}}) \left( 1 - \text{sub}^{\text{rate}(s)} + \text{tax}^{\text{rate}(s)} \right) + \beta^{k(s)} \gamma^{\text{yva}(s)} \left( p^{(s)} + \sum_{\dot{s} \in \text{SEC}} \beta^{x(\dot{s},s)} \lambda^{\text{PRODUCTION OF GOODS}^4(s,\dot{s})} \right) K^{(s)-1+\beta^{k(s)}} L^{(s)\beta^{1(s)}} = 0 \quad \left( K^{(s)} \right) \quad (2.12)$$

$$-p^l (1 + l^{\text{tax}}) \left( 1 - \text{sub}^{\text{rate}(s)} + \text{tax}^{\text{rate}(s)} \right) + \beta^{l(s)} \gamma^{\text{yva}(s)} \left( p^{(s)} + \sum_{\dot{s} \in \text{SEC}} \beta^{x(\dot{s},s)} \lambda^{\text{PRODUCTION OF GOODS}^4(s,\dot{s})} \right) K^{(s)\beta^{k(s)}} L^{(s)-1+\beta^{1(s)}} = 0 \quad \left( L^{(s)} \right) \quad (2.13)$$

$$\dot{s} \in \text{SEC}: \quad -\lambda^{\text{PRODUCTION OF GOODS}^4(s,\dot{s})} - p^{\text{int}(\dot{s})} \left( 1 - \text{sub}^{\text{rate}(s)} + \text{tax}^{\text{rate}(s)} \right) = 0 \quad \left( \left( X^{(\dot{s},s)} \right)_{\dot{s} \in \text{SEC}} \right) \quad (2.14)$$

## 3 TAXES PRODUCER

### 3.1 Identities

$$s \in \text{SEC}: \quad \text{SUB}^s(s) = \text{sub}^{\text{rate}(s)} \left( p^k K^{(s)} (1 + k^{\text{tax}}) + p^l L^{(s)} (1 + l^{\text{tax}}) + \sum_{\dot{s} \in \text{SEC}} p^{\text{int}(\dot{s})} X^{(\dot{s},s)} \right) \quad (3.1)$$

$$s \in \text{SEC}: \quad \text{TAX}^s(s) = \text{tax}^{\text{rate}(s)} \left( p^k K^{(s)} (1 + k^{\text{tax}}) + p^l L^{(s)} (1 + l^{\text{tax}}) + \sum_{\dot{s} \in \text{SEC}} p^{\text{int}(\dot{s})} X^{(\dot{s},s)} \right) \quad (3.2)$$

$$L^{\text{TAX}} = l^{\text{tax}} p^l \left( \sum_{s \in \text{SEC}} L^{(s)} \right) \quad (3.3)$$

$$K^{\text{TAX}} = k^{\text{tax}} p^k \left( \sum_{s \in \text{SEC}} K^{\langle s \rangle} \right) \quad (3.4)$$

## 4 EXPORT COMPOSITE $s \in \text{SEC}$

### 4.1 Optimisation problem

$$\max_{\text{EXPORT}^{\langle s \rangle}, \{ \text{EXP}^{\langle r, s \rangle} \}_{r \in \text{ROW}}} \Pi^{\text{EXP}^{\langle s \rangle}} = p^{\text{exp}^{\langle s \rangle}} \text{EXPORT}^{\langle s \rangle} - \sum_{r \in \text{ROW}} p^{\text{for}^{\langle r \rangle}} \text{EXP}^{\langle r, s \rangle} \quad (4.1)$$

s.t. :

$$\text{EXPORT}^{\langle s \rangle} = \theta^{\text{exp}^{\langle s \rangle}} \left( \sum_{r \in \text{ROW}} \alpha^{\text{exp}^{\langle r, s \rangle}} \left( am^{\text{exp}^{\langle r \rangle}} \text{EXP}^{\langle r, s \rangle} \right)^{\sigma^{\text{exp}^{\langle s \rangle} - 1} (1 + \sigma^{\text{exp}^{\langle s \rangle}})} \right)^{\sigma^{\text{exp}^{\langle s \rangle}} (1 + \sigma^{\text{exp}^{\langle s \rangle}})^{-1}} \left( \lambda^{\text{EXPORT}^{\text{COMPOSITE}^1 \langle s \rangle}} \right) \quad (4.2)$$

### 4.2 First order conditions

$$-\lambda^{\text{EXPORT}^{\text{COMPOSITE}^1 \langle s \rangle}} + p^{\text{exp}^{\langle s \rangle}} = 0 \quad \left( \text{EXPORT}^{\langle s \rangle} \right) \quad (4.3)$$

o

$$r \in \text{ROW}: \quad -p^{\text{for}^{\langle r \rangle}} + \alpha^{\text{exp}^{\langle r, s \rangle}} am^{\text{exp}^{\langle r \rangle}} \theta^{\text{exp}^{\langle s \rangle}} \lambda^{\text{EXPORT}^{\text{COMPOSITE}^1 \langle s \rangle}} \left( am^{\text{exp}^{\langle r \rangle}} \text{EXP}^{\langle r, s \rangle} \right)^{-1 + \sigma^{\text{exp}^{\langle s \rangle}} - 1} (1 + \sigma^{\text{exp}^{\langle s \rangle}})^{-1} \left( \sum_{r \in \text{ROW}} \alpha^{\text{exp}^{\langle r, s \rangle}} \left( am^{\text{exp}^{\langle r \rangle}} \text{EXP}^{\langle r, s \rangle} \right)^{\sigma^{\text{exp}^{\langle s \rangle}} - 1} (1 + \sigma^{\text{exp}^{\langle s \rangle}})} \right)^{-1 + \sigma^{\text{exp}^{\langle s \rangle}} (1 + \sigma^{\text{exp}^{\langle s \rangle}})^{-1}} = 0 \quad (4.4)$$

### 4.3 First order conditions after reduction

$$r \in \text{ROW}: \quad -p^{\text{for}^{\langle r \rangle}} + \alpha^{\text{exp}^{\langle r, s \rangle}} am^{\text{exp}^{\langle r \rangle}} \theta^{\text{exp}^{\langle s \rangle}} p^{\text{exp}^{\langle s \rangle}} \left( am^{\text{exp}^{\langle r \rangle}} \text{EXP}^{\langle r, s \rangle} \right)^{-1 + \sigma^{\text{exp}^{\langle s \rangle}} - 1} (1 + \sigma^{\text{exp}^{\langle s \rangle}})^{-1} \left( \sum_{r \in \text{ROW}} \alpha^{\text{exp}^{\langle r, s \rangle}} \left( am^{\text{exp}^{\langle r \rangle}} \text{EXP}^{\langle r, s \rangle} \right)^{\sigma^{\text{exp}^{\langle s \rangle}} - 1} (1 + \sigma^{\text{exp}^{\langle s \rangle}})} \right)^{-1 + \sigma^{\text{exp}^{\langle s \rangle}} (1 + \sigma^{\text{exp}^{\langle s \rangle}})^{-1}} = 0 \quad (4.5)$$

## 5 FINAL PRODUCT COMPOSITE $s \in SEC$

### 5.1 Optimisation problem

$$\max_{Y^{f(s)}, Y^{\text{HOME}(s)}, \text{EXPORT}^{f(s)}} \Pi^{Y(s)} = p^{(s)} Y^{f(s)} - p^{\text{home}(s)} Y^{\text{HOME}(s)} - p^{\text{exp}(s)} \text{EXPORT}^{f(s)} \quad (5.1)$$

s.t. :

$$Y^{f(s)} = \theta^{y(s)} \left( \alpha^{\text{prod}^h(s)} Y^{\text{HOME}(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) + \alpha^{\text{prod}^e(s)} \text{EXPORT}^{f(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \right)^{\sigma^{\text{fProd}(s)}} \left( 1 + \sigma^{\text{fProd}(s)} \right)^{-1} \left( \lambda^{\text{FINALPRODUCTCOMPOSITE}^1(s)} \right) \quad (5.2)$$

### 5.2 First order conditions

$$-\lambda^{\text{FINALPRODUCTCOMPOSITE}^1(s)} + p^{(s)} = 0 \quad \left( Y^{f(s)} \right) \quad (5.3)$$

$$\rightarrow -p^{\text{home}(s)} + \alpha^{\text{prod}^h(s)} \theta^{y(s)} \lambda^{\text{FINALPRODUCTCOMPOSITE}^1(s)} Y^{\text{HOME}(s)-1} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \left( \alpha^{\text{prod}^h(s)} Y^{\text{HOME}(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) + \alpha^{\text{prod}^e(s)} \text{EXPORT}^{f(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \right)^{\sigma^{\text{fProd}(s)-1}} \left( 1 + \sigma^{\text{fProd}(s)} \right)^{-1} \quad (5.4)$$

$$-p^{\text{exp}(s)} + \alpha^{\text{prod}^e(s)} \theta^{y(s)} \lambda^{\text{FINALPRODUCTCOMPOSITE}^1(s)} \text{EXPORT}^{f(s)-1} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \left( \alpha^{\text{prod}^h(s)} Y^{\text{HOME}(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) + \alpha^{\text{prod}^e(s)} \text{EXPORT}^{f(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \right)^{\sigma^{\text{fProd}(s)-1}} \left( 1 + \sigma^{\text{fProd}(s)} \right)^{-1} \quad (5.5)$$

### 5.3 First order conditions after reduction

$$-p^{\text{home}(s)} + \alpha^{\text{prod}^h(s)} \theta^{y(s)} p^{(s)} Y^{\text{HOME}(s)-1} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \left( \alpha^{\text{prod}^h(s)} Y^{\text{HOME}(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) + \alpha^{\text{prod}^e(s)} \text{EXPORT}^{f(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \right)^{-1} \sigma^{\text{fProd}(s)} \left( 1 + \sigma^{\text{fProd}(s)} \right)^{-1} \quad (5.6)$$

$$-p^{\text{exp}(s)} + \alpha^{\text{prod}^e(s)} \theta^{y(s)} p^{(s)} \text{EXPORT}^{f(s)-1} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \left( \alpha^{\text{prod}^h(s)} Y^{\text{HOME}(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) + \alpha^{\text{prod}^e(s)} \text{EXPORT}^{f(s)} \sigma^{\text{fProd}(s)-1} \left( 1 + \sigma^{\text{fProd}(s)} \right) \right)^{-1} \sigma^{\text{fProd}(s)} \left( 1 + \sigma^{\text{fProd}(s)} \right)^{-1} \quad (5.7)$$

## 6 IMPORT COMPOSITE $s \in SEC$

### 6.1 Optimisation problem

$$\max_{\text{IMPORT}^{(s)}, (\text{IMP}^{(r,s)})_{r \in ROW}} \Pi^{\text{IMP}^{(s)}} = p^{\text{imp}^{(s)}} \text{IMPORT}^{(s)} - \sum_{r \in ROW} p^{\text{for}^{(r)}} \text{ex}^{\text{rate}^{(r)}} \text{IMP}^{(r,s)} \left(1 + \text{im}^{\text{tax}^{(r,s)}}\right) \quad (6.1)$$

s.t. :

$$\text{IMPORT}^{(s)} = \theta^{\text{imp}^{(s)}} \left( \sum_{r \in ROW} \alpha^{\text{imp}^{(r,s)}} \left( \text{am}^{\text{imp}^{(r)}} \text{IMP}^{(r,s)} \right)^{\sigma^{\text{imp}^{(s)}-1} (-1 + \sigma^{\text{imp}^{(s)}})} \right)^{\sigma^{\text{imp}^{(s)}} (-1 + \sigma^{\text{imp}^{(s)}})^{-1}} \left( \lambda^{\text{IMPORT}^{\text{COMPOSITE}^1 (s)}} \right) \quad (6.2)$$

### 6.2 First order conditions

$$-\lambda^{\text{IMPORT}^{\text{COMPOSITE}^1 (s)}} + p^{\text{imp}^{(s)}} = 0 \quad \left( \text{IMPORT}^{(s)} \right) \quad (6.3)$$

$$r \in ROW: \quad -p^{\text{for}^{(r)}} \text{ex}^{\text{rate}^{(r)}} \left(1 + \text{im}^{\text{tax}^{(r,s)}}\right) + \alpha^{\text{imp}^{(r,s)}} \text{am}^{\text{imp}^{(r)}} \theta^{\text{imp}^{(s)}} \lambda^{\text{IMPORT}^{\text{COMPOSITE}^1 (s)}} \left( \text{am}^{\text{imp}^{(r)}} \text{IMP}^{(r,s)} \right)^{-1 + \sigma^{\text{imp}^{(s)}-1} (-1 + \sigma^{\text{imp}^{(s)}})} \left( \sum_{r \in ROW} \alpha^{\text{imp}^{(r,s)}} \left( \text{am}^{\text{imp}^{(r)}} \text{IMP}^{(r,s)} \right)^{\sigma^{\text{imp}^{(s)}-1} (-1 + \sigma^{\text{imp}^{(s)}})} \right)^{\sigma^{\text{imp}^{(s)}} (-1 + \sigma^{\text{imp}^{(s)}})^{-1}} = 0 \quad (6.4)$$

$\infty$

### 6.3 First order conditions after reduction

$$r \in ROW: \quad -p^{\text{for}^{(r)}} \text{ex}^{\text{rate}^{(r)}} \left(1 + \text{im}^{\text{tax}^{(r,s)}}\right) + \alpha^{\text{imp}^{(r,s)}} \text{am}^{\text{imp}^{(r)}} \theta^{\text{imp}^{(s)}} p^{\text{imp}^{(s)}} \left( \text{am}^{\text{imp}^{(r)}} \text{IMP}^{(r,s)} \right)^{-1 + \sigma^{\text{imp}^{(s)}-1} (-1 + \sigma^{\text{imp}^{(s)}})} \left( \sum_{r \in ROW} \alpha^{\text{imp}^{(r,s)}} \left( \text{am}^{\text{imp}^{(r)}} \text{IMP}^{(r,s)} \right)^{\sigma^{\text{imp}^{(s)}-1} (-1 + \sigma^{\text{imp}^{(s)}})} \right)^{\sigma^{\text{imp}^{(s)}} (-1 + \sigma^{\text{imp}^{(s)}})^{-1}} = 0 \quad (6.5)$$

## 7 ARMINGTON COMPOSITE $s \in SEC$

### 7.1 Optimisation problem

$$\max_{\text{ARM}^{(s)}, \text{Y}^{\text{HOME}^a (s)}, \text{IMPORT}^a (s)} \Pi^{\text{ARM}^{(s)}} = -p^{\text{home}^{(s)}} \text{Y}^{\text{HOME}^a (s)} + p^{\text{arm}^{(s)}} \text{ARM}^{(s)} - p^{\text{imp}^{(s)}} \text{IMPORT}^a (s) \quad (7.1)$$

s.t. :

$$\text{ARM}^{(s)} = \theta^{\text{arm}^{(s)}} \left( \alpha^{\text{arm}^h (s)} \text{Y}^{\text{HOME}^a (s)} \sigma^{\text{arm}^{(s)}-1} (-1 + \sigma^{\text{arm}^{(s)}}) + \alpha^{\text{arm}^i (s)} \text{IMPORT}^a (s) \sigma^{\text{arm}^{(s)}-1} (-1 + \sigma^{\text{arm}^{(s)}}) \right)^{\sigma^{\text{arm}^{(s)}} (-1 + \sigma^{\text{arm}^{(s)}})^{-1}} \left( \lambda^{\text{ARMINGTON}^{\text{COMPOSITE}^1 (s)}} \right) \quad (7.2)$$



## 7.2 First order conditions

$$-\lambda_{\text{ARMINGTONCOMPOSITE}^1 \langle s \rangle} + p^{\text{arm} \langle s \rangle} = 0 \quad \left( \text{ARM}^{\langle s \rangle} \right) \quad (7.3)$$

$$-p^{\text{home} \langle s \rangle} + \alpha^{\text{arm}^h \langle s \rangle} \theta^{\text{arm} \langle s \rangle} \lambda_{\text{ARMINGTONCOMPOSITE}^1 \langle s \rangle} Y^{\text{HOME}^a \langle s \rangle - 1 + \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle})} \left( \alpha^{\text{arm}^h \langle s \rangle} Y^{\text{HOME}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle})} + \alpha^{\text{arm}^i \langle s \rangle} \text{IMPORT}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle}) \right)^{-1 + \sigma^{\text{arm} \langle s \rangle} (-1 + \sigma^{\text{arm} \langle s \rangle})} \quad (7.4)$$

$$-p^{\text{imp} \langle s \rangle} + \alpha^{\text{arm}^i \langle s \rangle} \theta^{\text{arm} \langle s \rangle} \lambda_{\text{ARMINGTONCOMPOSITE}^1 \langle s \rangle} \text{IMPORT}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle}) \left( \alpha^{\text{arm}^h \langle s \rangle} Y^{\text{HOME}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle})} + \alpha^{\text{arm}^i \langle s \rangle} \text{IMPORT}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle}) \right)^{-1 + \sigma^{\text{arm} \langle s \rangle} (-1 + \sigma^{\text{arm} \langle s \rangle})} \quad (7.5)$$

## 7.3 First order conditions after reduction

$$-p^{\text{home} \langle s \rangle} + \alpha^{\text{arm}^h \langle s \rangle} \theta^{\text{arm} \langle s \rangle} p^{\text{arm} \langle s \rangle} Y^{\text{HOME}^a \langle s \rangle - 1 + \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle})} \left( \alpha^{\text{arm}^h \langle s \rangle} Y^{\text{HOME}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle})} + \alpha^{\text{arm}^i \langle s \rangle} \text{IMPORT}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle}) \right)^{-1 + \sigma^{\text{arm} \langle s \rangle} (-1 + \sigma^{\text{arm} \langle s \rangle})} \quad (7.6)$$

$$-p^{\text{imp} \langle s \rangle} + \alpha^{\text{arm}^i \langle s \rangle} \theta^{\text{arm} \langle s \rangle} p^{\text{arm} \langle s \rangle} \text{IMPORT}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle}) \left( \alpha^{\text{arm}^h \langle s \rangle} Y^{\text{HOME}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle})} + \alpha^{\text{arm}^i \langle s \rangle} \text{IMPORT}^a \langle s \rangle \sigma^{\text{arm} \langle s \rangle - 1} (-1 + \sigma^{\text{arm} \langle s \rangle}) \right)^{-1 + \sigma^{\text{arm} \langle s \rangle} (-1 + \sigma^{\text{arm} \langle s \rangle})} \quad (7.7)$$

## 8 SALES $s \in \text{SEC}$

### 8.1 Identities

$$\text{TAX}^p \langle s \rangle = \text{EXCISE} \langle s \rangle + \text{VAT} \langle s \rangle \quad (8.1)$$

$$\text{VAT} \langle s \rangle = \text{wt} \langle s \rangle p^{\text{market} \langle s \rangle} \left( 1 + \text{excise} \langle s \rangle \right) \left( D^{\text{GOV} \langle s \rangle} + \text{INV} \langle s \rangle + \sum_{h \in \text{HHD}} \text{scale} \langle h \rangle D \langle s, h \rangle \right) \quad (8.2)$$

$$\text{EXCISE} \langle s \rangle = \text{excise} \langle s \rangle p^{\text{market} \langle s \rangle} \left( D^{\text{GOV} \langle s \rangle} + \text{INV} \langle s \rangle + \sum_{h \in \text{HHD}} \text{scale} \langle h \rangle D \langle s, h \rangle + \sum_{\vec{s} \in \text{SEC}} X \langle s, \vec{s} \rangle \right) \quad (8.3)$$

## 9 FIRM

### 9.1 Identities

$$INC^{\text{FIRM}} = BTINC^{\text{FIRM}} (1 - \text{firm}^{\text{tax}}) \quad (9.1)$$

$$BTINC^{\text{FIRM}} = PROFIT + TBANKFIRM + TGOVFIRM + p^k K^{\text{FIRM}} + \sum_{r \in \text{ROW}} TROWFIRM^{(r)} \quad (9.2)$$

$$PROFIT = \sum_{s \in \text{SEC}} \pi^{(s)} \quad (9.3)$$

$$K^{\text{FIRM}} = \alpha x^f KS \quad (9.4)$$

$$SAV^{\text{FIRM}} + TRAN^{\text{FIRM}} = INC^{\text{FIRM}} \quad (9.5)$$

$$TRAN^{\text{FIRM}} = TFIRMBANK + \sum_{h \in \text{HHD}} \text{scale}^{(h)} TFIRMH^{(h)} + \sum_{r \in \text{ROW}} e^{r \cdot \text{rate}^{(r)}} TFIRMROW^{(r)} \quad (9.6)$$

$$h \in \text{HHD}: \quad \text{scale}^{(h)} TFIRMH^{(h)} = \alpha w^f{}^{(h)} INC^{\text{FIRM}} \quad (9.7)$$

$$r \in \text{ROW}: \quad e^{r \cdot \text{rate}^{(r)}} TFIRMROW^{(r)} = \alpha w^f{}^{(r)} INC^{\text{FIRM}} \quad (9.8)$$

$$TFIRMBANK = \alpha w^b INC^{\text{FIRM}} \quad (9.9)$$

10

## 10 BANK

### 10.1 Identities

$$INC^{\text{BANK}} = BTINC^{\text{BANK}} (1 - \text{bank}^{\text{tax}}) \quad (10.1)$$

$$BTINC^{\text{BANK}} = TFIRMBANK + TGOVBANK + p^k K^{\text{BANK}} + \sum_{h \in \text{HHD}} \text{scale}^{(h)} THBANK^{(h)} + \sum_{r \in \text{ROW}} TROWBANK^{(r)} \quad (10.2)$$

$$K^{\text{BANK}} = \alpha x^b KS \quad (10.3)$$

$$SAV^{\text{BANK}} + TRAN^{\text{BANK}} = INC^{\text{BANK}} \quad (10.4)$$

$$TRAN^{\text{BANK}} = TBANKFIRM + \sum_{h \in \text{HHD}} \text{scale}^{(h)} TBANKH^{(h)} + \sum_{r \in \text{ROW}} e^{r \cdot \text{rate}^{(r)}} TBANKROW^{(r)} \quad (10.5)$$

$$h \in \text{HHD}: \quad \text{scale}^{(h)} TBANKH^{(h)} = \alpha w^b{}^{(h)} INC^{\text{BANK}} \quad (10.6)$$

$$r \in \text{ROW}: \quad e^{r \cdot \text{rate}^{(r)}} TBANKROW^{(r)} = \alpha w^b{}^{(r)} INC^{\text{BANK}} \quad (10.7)$$

$$TBANKFIRM = \alpha w^f INC^{\text{BANK}} \quad (10.8)$$

# 11 GOVERNMENT

## 11.1 Identities

$$INC^{GOV} = CIT + EXCISE + IMTAX + PIT + SOCTAX + STAX + TROWGOV + VAT \quad (11.1)$$

$$VAT = \sum_{s \in SEC} VAT^{(s)} \quad (11.2)$$

$$EXCISE = \sum_{s \in SEC} EXCISE^{(s)} \quad (11.3)$$

$$STAX = \sum_{s \in SEC} TAX^s \quad (11.4)$$

$$SOCTAX = K^{TAX} + L^{TAX} \quad (11.5)$$

$$IMTAX = \sum_{s \in SEC} \sum_{r \in ROW} im^{tax(r,s)} p^{for(r)} ex^{rate(r)} IMP^{(r,s)} \quad (11.6)$$

$$PIT = \sum_{h \in HHD} pit^{tax(h)} scale^{(h)} PIT^{base(h)} \quad (11.7)$$

$$CIT = BANKTAX + FIRMTAX \quad (11.8)$$

$$FIRMTAX = firm^{tax} BTINC^{FIRM} \quad (11.9)$$

$$BANKTAX = bank^{tax} BTINC^{BANK} \quad (11.10)$$

$$TROWGOV = \sum_{r \in ROW} TROWGOV^{(r)} \quad (11.11)$$

$$EXP^{GOV} = DEM^{GOV} + SUB + TRAN^{GOV} \quad (11.12)$$

$$DEM^{GOV} = \sum_{s \in SEC} p^{cons(s)} D^{GOV(s)} \quad (11.13)$$

$$s \in SEC: p^{cons(s)} D^{GOV(s)} = dgov^{data(s)} \quad (11.14)$$

$$SUB = \sum_{s \in SEC} SUB^s + \sum_{s \in SEC} SUB^p \quad (11.15)$$

$$s \in SEC: SUB^p = sub^p \cdot ARM^s \quad (11.16)$$

$$TRAN^{GOV} = TGOVFIRM + TGOVBANK + \sum_{h \in HHD} scale^{(h)} TGOVH^{(h)} + \sum_{r \in ROW} ex^{rate(r)} TGOVROW^{(r)} \quad (11.17)$$

$$h \in HHD: scale^{(h)} TGOVH^{(h)} = tgovh^{data(h)} + tgovh^{data^{extra}(h)} \quad (11.18)$$

$$r \in ROW: \quad ex^{\text{rate}\langle r \rangle} TGOVROW^{\langle r \rangle} = tgovrow^{\text{data}\langle r \rangle} \quad (11.19)$$

$$TGOVFIRM = tgovfirm^{\text{data}} \quad (11.20)$$

$$TGOVBANK = tgovbank^{\text{data}} \quad (11.21)$$

$$INC^{\text{GOV}} = EXP^{\text{GOV}} + SAV^{\text{GOV}} \quad (11.22)$$

## 12 REST OF THE WORLD $r \in ROW$

### 12.1 Identities

$$INC^{\text{ROW}\langle r \rangle} = IMPORT^{\text{ROW}\langle r \rangle} + ex^{\text{rate}\langle r \rangle} \left( TBANKROW^{\langle r \rangle} + TFIRMROW^{\langle r \rangle} + TGOVROW^{\langle r \rangle} + \sum_{h \in HHD} scale^{\langle h \rangle} THROW^{\langle h, r \rangle} \right) \quad (12.1)$$

$$IMPORT^{\text{ROW}\langle r \rangle} = p^{\text{for}\langle r \rangle} ex^{\text{rate}\langle r \rangle} \left( \sum_{s \in SEC} IMP^{\langle r, s \rangle} \right) \quad (12.2)$$

$$EXP^{\text{ROW}\langle r \rangle} = EXPORT^{\text{ROW}\langle r \rangle} + TRAN^{\langle r \rangle} \quad (12.3)$$

$$EXPORT^{\text{ROW}\langle r \rangle} = p^{\text{for}\langle r \rangle} \left( \sum_{s \in SEC} EXP^{\langle r, s \rangle} \right) \quad (12.4)$$

$$TRAN^{\langle r \rangle} = TROWFIRM^{\langle r \rangle} + TROWBANK^{\langle r \rangle} + TROWGOV^{\langle r \rangle} + \sum_{h \in HHD} scale^{\langle h \rangle} TROWH^{\langle r, h \rangle} \quad (12.5)$$

$$TROWFIRM^{\langle r \rangle} = t^{\text{f}\langle r \rangle} EXP^{\text{ROW}\langle r \rangle} \quad (12.6)$$

$$TROWGOV^{\langle r \rangle} = t^{\text{rg}\langle r \rangle} EXP^{\text{ROW}\langle r \rangle} \quad (12.7)$$

$$h \in HHD: \quad scale^{\langle h \rangle} TROWH^{\langle r, h \rangle} = t^{\text{rh}\langle r, h \rangle} EXP^{\text{ROW}\langle r \rangle} \quad (12.8)$$

$$TROWBANK^{\langle r \rangle} = t^{\text{rb}\langle r \rangle} EXP^{\text{ROW}\langle r \rangle} \quad (12.9)$$

$$INC^{\text{ROW}\langle r \rangle} = EXP^{\text{ROW}\langle r \rangle} + SAV^{\langle r \rangle} \quad (12.10)$$

## 13 CAPITAL

### 13.1 Identities

$$SAV = SAV^{\text{FIRM}} + SAV^{\text{BANK}} + SAV^{\text{GOV}} + \sum_{h \in HHD} scale^{\langle h \rangle} SAV^{\langle h \rangle} + \sum_{r \in ROW} SAV^{\langle r \rangle} \quad (13.1)$$

$$s \in SEC: \quad p^{\text{cons}\langle s \rangle} INV^{\langle s \rangle} = iw^{\langle s \rangle} INV \quad (13.2)$$

## 14 MARKET CLEARING

### 14.1 Identities

$$s \in SEC: \quad ARM^{(s)} = D^{GOV^{(s)}} + INV^{(s)} + \sum_{h \in HHD} scale^{(h)} D^{(s,h)} + \sum_{si \in SEC} X^{(s,si)} \quad (14.1)$$

$$s \in SEC: \quad EXPORF^{(s)} = EXPOR^{(s)} \quad (14.2)$$

$$s \in SEC: \quad IMPORF^{(s)} = IMPOR^{(s)} \quad (14.3)$$

$$s \in SEC: \quad Y^{HOME^a^{(s)}} = Y^{HOME^{(s)}} \quad (14.4)$$

$$s \in SEC: \quad Y^f^{(s)} = Y^{(s)} \quad (14.5)$$

$$\left( \sum_{s \in SEC} p^{(s)} ARM^{(s)} \right) \left( \sum_{si \in SEC} ARM^{(si)} \right)^{-1} = 1 \quad (14.6)$$

$$KS = \sum_{s \in SEC} K^{(s)} \quad (14.7)$$

$$KS = k^{\text{total}^{\text{data}}} \quad (14.8)$$

$$\sum_{s \in SEC} L^{(s)} = \sum_{h \in HHD} scale^{(h)} L^{(h)} \quad (14.9)$$

$$LS = \sum_{h \in HHD} scale^{(h)} L^{(h)} \quad (14.10)$$

$$h \in HHD: \quad UNEMP^{(h)} = 0 \quad (14.11)$$

$$r \in ROW: \quad ex^{\text{rate}^{(r)}} = 1 \quad (14.12)$$

$$s \in SEC: \quad p^{\text{int}^{(s)}} = p^{\text{market}^{(s)}} \left( 1 + exise^{(s)} \right) \quad (14.13)$$

$$s \in SEC: \quad p^{\text{cons}^{(s)}} = p^{\text{market}^{(s)}} \left( 1 + exise^{(s)} \right) \left( 1 + wt^{(s)} \right) \quad (14.14)$$

$$s \in SEC: \quad p^{\text{market}^{(s)}} = -sub^{\text{D}^{(s)}} + p^{\text{arm}^{(s)}} \quad (14.15)$$

## 15 Equilibrium relationships (before expansion and reduction)

$$1 - \left( \sum_{s \in SEC} p^{(s)} ARM^{(s)} \right) \left( \sum_{si \in SEC} ARM^{(si)} \right)^{-1} = 0 \quad (15.1)$$

$$k^{\text{total}^{\text{data}}} - KS = 0 \quad (15.2)$$

$$t_{gov} firm^{\text{data}} - TGOVFIRM = 0 \quad (15.3)$$

$$t_{gov} bank^{\text{data}} - TGOVBANK = 0 \quad (15.4)$$

$$-BANKTAX + bank^{\text{tax}} BTINC^{\text{BANK}} = 0 \quad (15.5)$$

$$-DEM^{\text{GOV}} + \sum_{s \in SEC} p^{\text{cons}(s)} D^{\text{GOV}(s)} = 0 \quad (15.6)$$

$$-EXCISE + \sum_{s \in SEC} EXCISE^{(s)} = 0 \quad (15.7)$$

$$-FIRMTAX + firm^{\text{tax}} BTINC^{\text{FIRM}} = 0 \quad (15.8)$$

$$-IMTAX + \sum_{s \in SEC} \sum_{r \in ROW} im^{\text{tax}(r,s)} p^{\text{for}(r)} ex^{\text{rate}(r)} IMP^{(r,s)} = 0 \quad (15.9)$$

$$-INC^{\text{FIRM}} + BTINC^{\text{FIRM}} (1 - firm^{\text{tax}}) = 0 \quad (15.10)$$

$$-INC^{\text{BANK}} + BTINC^{\text{BANK}} (1 - bank^{\text{tax}}) = 0 \quad (15.11)$$

$$-K^{\text{TAX}} + k^{\text{tax}} p^k \left( \sum_{s \in SEC} K^{(s)} \right) = 0 \quad (15.12)$$

$$-K^{\text{FIRM}} + \alpha w^f KS = 0 \quad (15.13)$$

$$-K^{\text{BANK}} + \alpha w^b KS = 0 \quad (15.14)$$

$$-KS + \sum_{s \in SEC} K^{(s)} = 0 \quad (15.15)$$

$$-L^{\text{TAX}} + l^{\text{tax}} p^l \left( \sum_{s \in SEC} L^{(s)} \right) = 0 \quad (15.16)$$

$$-LS + \sum_{h \in HHD} scale^{(h)} L^{(h)} = 0 \quad (15.17)$$

$$-PIT + \sum_{h \in HHD} pit^{\text{tax}(h)} scale^{(h)} PIT^{\text{base}(h)} = 0 \quad (15.18)$$

$$-PROFIT + \sum_{s \in SEC} \pi^{(s)} = 0 \quad (15.19)$$

$$-STAX + \sum_{s \in SEC} TAX^s(s) = 0 \quad (15.20)$$

$$-TBANKFIRM + \text{out}^f INC^{\text{BANK}} = 0 \quad (15.21)$$

$$-TFIRMBANK + \text{out}^b INC^{\text{FIRM}} = 0 \quad (15.22)$$

$$-TROWGOV + \sum_{r \in ROW} TROWGOV^{(r)} = 0 \quad (15.23)$$

$$-VAT + \sum_{s \in SEC} VAT^{(s)} = 0 \quad (15.24)$$

$$\sum_{h \in HHD} \text{scale}^{(h)} L^{(h)} - \sum_{s \in SEC} L^{(s)} = 0 \quad (15.25)$$

$$BANKTAX - CIT + FIRMTAX = 0 \quad (15.26)$$

$$EXP^{\text{GOV}} - INC^{\text{GOV}} + SAV^{\text{GOV}} = 0 \quad (15.27)$$

$$INC^{\text{FIRM}} - SAV^{\text{FIRM}} - TRAN^{\text{FIRM}} = 0 \quad (15.28)$$

$$INC^{\text{BANK}} - SAV^{\text{BANK}} - TRAN^{\text{BANK}} = 0 \quad (15.29)$$

$$K^{\text{TAX}} + L^{\text{TAX}} - SOCTAX = 0 \quad (15.30)$$

$$-SUB + \sum_{s \in SEC} SUB^s(s) + \sum_{s \in SEC} SUB^p(s) = 0 \quad (15.31)$$

$$DEM^{\text{GOV}} - EXP^{\text{GOV}} + SUB + TRAN^{\text{GOV}} = 0 \quad (15.32)$$

$$TBANKFIRM - TRAN^{\text{BANK}} + \sum_{h \in HHD} \text{scale}^{(h)} TBANKH^{(h)} + \sum_{r \in ROW} \text{ex}^{\text{rate}(r)} TBANKROW^{(r)} = 0 \quad (15.33)$$

$$TFIRMBANK - TRAN^{\text{FIRM}} + \sum_{h \in HHD} \text{scale}^{(h)} TFIRMH^{(h)} + \sum_{r \in ROW} \text{ex}^{\text{rate}(r)} TFIRMROW^{(r)} = 0 \quad (15.34)$$

$$TGOVFIRM + TGOVBANK - TRAN^{\text{GOV}} + \sum_{h \in HHD} \text{scale}^{(h)} TGOVH^{(h)} + \sum_{r \in ROW} \text{ex}^{\text{rate}(r)} TGOVROW^{(r)} = 0 \quad (15.35)$$

$$-BTINC^{\text{FIRM}} + PROFIT + TBANKFIRM + TGOVFIRM + p^k K^{\text{FIRM}} + \sum_{r \in ROW} TROWFIRM^{(r)} = 0 \quad (15.36)$$

$$-BTINC^{\text{BANK}} + TFIRMBANK + TGOVBANK + p^k K^{\text{BANK}} + \sum_{h \in HHD} \text{scale}^{(h)} THBANK^{(h)} + \sum_{r \in ROW} TROWBANK^{(r)} = 0 \quad (15.37)$$

$$-SAV + SAV^{\text{FIRM}} + SAV^{\text{BANK}} + SAV^{\text{GOV}} + \sum_{h \in \text{HHD}} \text{scale}^{\langle h \rangle} SAV^{\langle h \rangle} + \sum_{r \in \text{ROW}} SAV^{\langle r \rangle} = 0 \quad (15.38)$$

$$CIT + EXCISE + IMTAX - INC^{\text{GOV}} + PIT + SOCTAX + STAX + TROWGOV + VAT = 0 \quad (15.39)$$

$$h \in \text{HHD}: \quad -UNEMP^{\langle h \rangle} = 0 \quad (15.40)$$

$$h \in \text{HHD}: \quad \text{le}^{\langle h \rangle} - \text{scale}^{\langle h \rangle} \left( LEIS^{\langle h \rangle} + LL^{\langle h \rangle} \right) = 0 \quad (15.41)$$

$$h \in \text{HHD}: \quad -DEM^{\langle h \rangle} + \theta^{\text{dem}^{\langle h \rangle}} \left( \sum_{s \in \text{SEC}} \alpha^{\langle s, h \rangle} D^{\langle s, h \rangle} \omega^{-1(-1+\omega)} \right)^{\omega(-1+\omega)^{-1}} = 0 \quad (15.42)$$

$$h \in \text{HHD}: \quad -SAV^{\langle h \rangle} + \text{sw}^{\langle h \rangle} INC^{\langle h \rangle} = 0 \quad (15.43)$$

$$h \in \text{HHD}: \quad -THBANK^{\langle h \rangle} + \text{auh}^{\text{b}^{\langle h \rangle}} INC^{\langle h \rangle} = 0 \quad (15.44)$$

$$h \in \text{HHD}: \quad U^{\langle h \rangle} - \left( \alpha^{\text{u}^{\langle h \rangle}} DEM^{\langle h \rangle} \omega^{\text{u}^{\langle h \rangle} - 1(-1+\omega^{\text{u}^{\langle h \rangle})} + \left( 1 - \alpha^{\text{u}^{\langle h \rangle}} \right) LEIS^{\langle h \rangle} \omega^{\text{u}^{\langle h \rangle} - 1(-1+\omega^{\text{u}^{\langle h \rangle})} \right)^{\omega^{\text{u}^{\langle h \rangle}}(-1+\omega^{\text{u}^{\langle h \rangle})^{-1}} = 0 \quad (15.45)$$

$$h \in \text{HHD}: \quad k^{\text{total}^{\text{data}}} \text{awc}^{\langle h \rangle} - \text{scale}^{\langle h \rangle} K^{\langle h \rangle} = 0 \quad (15.46)$$

$$h \in \text{HHD}: \quad \text{awf}^{\langle h \rangle} INC^{\text{FIRM}} - \text{scale}^{\langle h \rangle} TFIRMH^{\langle h \rangle} = 0 \quad (15.47)$$

$$h \in \text{HHD}: \quad \text{awb}^{\text{h}^{\langle h \rangle}} INC^{\text{BANK}} - \text{scale}^{\langle h \rangle} TBANKH^{\langle h \rangle} = 0 \quad (15.48)$$

$$h \in \text{HHD}: \quad -\text{scale}^{\langle h \rangle} \lambda^{\text{CONSUMER}^1 \langle h \rangle} + \left( 1 - \alpha^{\text{u}^{\langle h \rangle}} \right) LEIS^{\langle h \rangle} \omega^{\text{u}^{\langle h \rangle} - 1(-1+\omega^{\text{u}^{\langle h \rangle})} \left( \alpha^{\text{u}^{\langle h \rangle}} DEM^{\langle h \rangle} \omega^{\text{u}^{\langle h \rangle} - 1(-1+\omega^{\text{u}^{\langle h \rangle})} + \left( 1 - \alpha^{\text{u}^{\langle h \rangle}} \right) LEIS^{\langle h \rangle} \omega^{\text{u}^{\langle h \rangle} - 1(-1+\omega^{\text{u}^{\langle h \rangle})} \right)^{-1+\omega^{\text{u}^{\langle h \rangle}}(-1+\omega^{\text{u}^{\langle h \rangle})^{-1}} = 0 \quad (15.49)$$

$$h \in \text{HHD}: \quad p^{\text{k}} \left( -\lambda^{\text{CONSUMER}^{12} \langle h \rangle} + \text{auh}^{\text{b}^{\langle h \rangle}} \lambda^{\text{CONSUMER}^{12} \langle h \rangle} - \text{pit}^{\text{tax}^{\langle h \rangle}} \left( -\lambda^{\text{CONSUMER}^{12} \langle h \rangle} + \text{auh}^{\text{b}^{\langle h \rangle}} \lambda^{\text{CONSUMER}^{12} \langle h \rangle} + \text{sw}^{\langle h \rangle} \lambda^{\text{CONSUMER}^{12} \langle h \rangle} + \sum_{r \in \text{ROW}} \text{auh}^{\text{r}^{\langle h, r \rangle}} \lambda^{\text{CONSUMER}^{11} \langle h \rangle} \right) \right) \quad (15.50)$$

$$h \in \text{HHD}: \quad \text{tgoah}^{\text{data}^{\langle h \rangle}} + \text{tgoah}^{\text{data}^{\text{extra}^{\langle h \rangle}}} - \text{scale}^{\langle h \rangle} TGOVH^{\langle h \rangle} = 0 \quad (15.51)$$

$$h \in \text{HHD}: \quad BIINC^{\langle h \rangle} - INC^{\langle h \rangle} - \text{pit}^{\text{tax}^{\langle h \rangle}} PIT^{\text{base}^{\langle h \rangle}} = 0 \quad (15.52)$$

$$h \in \text{HHD}: \quad L^{\langle h \rangle} - LL^{\langle h \rangle} + UNEMP^{\langle h \rangle} = 0 \quad (15.53)$$

$$h \in \text{HHD}: \quad THBANK^{\langle h \rangle} - TRAN^{\langle h \rangle} + \sum_{r \in \text{ROW}} \text{er}^{\text{rate}^{\langle r \rangle}} THROW^{\langle h, r \rangle} = 0 \quad (15.54)$$

$$h \in \text{HHD}: \quad -\text{scale}^{\langle h \rangle} \lambda^{\text{CONSUMER}^1 \langle h \rangle} + p^1 \left( -\lambda^{\text{CONSUMER}^{12} \langle h \rangle} + \text{auh}^{\text{b}^{\langle h \rangle}} \lambda^{\text{CONSUMER}^{12} \langle h \rangle} - \text{pit}^{\text{tax}^{\langle h \rangle}} \left( -\lambda^{\text{CONSUMER}^{12} \langle h \rangle} + \text{auh}^{\text{b}^{\langle h \rangle}} \lambda^{\text{CONSUMER}^{12} \langle h \rangle} + \text{sw}^{\langle h \rangle} \lambda^{\text{CONSUMER}^{12} \langle h \rangle} + \sum_{r \in \text{ROW}} \text{auh}^{\text{r}^{\langle h, r \rangle}} \lambda^{\text{CONSUMER}^{11} \langle h \rangle} \right) \right) \quad (15.55)$$



$$h \in HHD: \quad -pt^{\text{free}} + BTINC^{\langle h \rangle} - PIT^{\text{base}\langle h \rangle} - \epsilon ip^1 L^{\langle h \rangle} = 0 \quad (15.56)$$

$$h \in HHD: \quad -BTINC^{\langle h \rangle} + TINSTH^{\langle h \rangle} + p^k K^{\langle h \rangle} + p^1 L^{\langle h \rangle} = 0 \quad (15.57)$$

$$h \in HHD: \quad -INC^{\langle h \rangle} + SAV^{\langle h \rangle} + TRAN^{\langle h \rangle} + \sum_{s \in SEC} p^{\text{cons}\langle s \rangle} D^{\langle s, h \rangle} = 0 \quad (15.58)$$

$$h \in HHD: \quad TBANKH^{\langle h \rangle} + TFIRMH^{\langle h \rangle} + TGOVH^{\langle h \rangle} - TINSTH^{\langle h \rangle} + \sum_{r \in ROW} TROWH^{\langle r, h \rangle} = 0 \quad (15.59)$$

$$h \in HHD: \quad r \in ROW: \quad \text{aut}^r \langle h, r \rangle INC^{\langle h \rangle} - \text{ex}^{\text{rate}\langle r \rangle} TROW^{\langle h, r \rangle} = 0 \quad (15.60)$$

$$h \in HHD: \quad r \in ROW: \quad \text{ex}^{\text{rate}\langle r \rangle} \lambda^{\text{CONSUMER}^{12}\langle h \rangle} - \text{ex}^{\text{rate}\langle r \rangle} \lambda^{\text{CONSUMER}^{11}\langle h, r \rangle} = 0 \quad (15.61)$$

$$h \in HHD: \quad s \in SEC: \quad \lambda^{\text{CONSUMER}^{12}\langle h \rangle} p^{\text{cons}\langle s \rangle} + \alpha^{\langle s, h \rangle} \alpha^u \langle h \rangle \theta^{\text{dem}\langle h \rangle} D^{\langle s, h \rangle} \omega^{-1} (-1 + \omega)^{-1} \omega^{-1} DEM^{\langle h \rangle} \omega^{-1} (-1 + \omega^u \langle h \rangle)^{-1} (-1 + \omega^u \langle h \rangle) \left( \alpha^u \langle h \rangle DEM^{\langle h \rangle} \omega^{u \langle h \rangle - 1} (-1 + \omega^u \langle h \rangle) \right) + (1 - \alpha^u \langle h \rangle) LEIS^{\langle h \rangle} \omega^{u \langle h \rangle} = 0 \quad (15.62)$$

$$r \in ROW: \quad 1 - \text{ex}^{\text{rate}\langle r \rangle} = 0 \quad (15.63)$$

$$r \in ROW: \quad \text{tgorow}^{\text{data}\langle r \rangle} - \text{ex}^{\text{rate}\langle r \rangle} TGOVROW^{\langle r \rangle} = 0 \quad (15.64)$$

$$r \in ROW: \quad -EXPORT^{\text{ROW}\langle r \rangle} + p^{\text{for}\langle r \rangle} \left( \sum_{s \in SEC} EXP^{\langle r, s \rangle} \right) = 0 \quad (15.65)$$

$$r \in ROW: \quad -IMPORT^{\text{ROW}\langle r \rangle} + p^{\text{for}\langle r \rangle} \text{ex}^{\text{rate}\langle r \rangle} \left( \sum_{s \in SEC} IMP^{\langle r, s \rangle} \right) = 0 \quad (15.66)$$

$$r \in ROW: \quad -TROWFIRM^{\langle r \rangle} + t^{\text{rf}\langle r \rangle} EXP^{\text{ROW}\langle r \rangle} = 0 \quad (15.67)$$

$$r \in ROW: \quad -TROWBANK^{\langle r \rangle} + t^{\text{rb}\langle r \rangle} EXP^{\text{ROW}\langle r \rangle} = 0 \quad (15.68)$$

$$r \in ROW: \quad -TROWGOV^{\langle r \rangle} + t^{\text{rg}\langle r \rangle} EXP^{\text{ROW}\langle r \rangle} = 0 \quad (15.69)$$

$$r \in ROW: \quad \text{awf}^{\langle r \rangle} INC^{\text{FIRM}} - \text{ex}^{\text{rate}\langle r \rangle} TFIRMROW^{\langle r \rangle} = 0 \quad (15.70)$$

$$r \in ROW: \quad \text{aub}^r \langle r \rangle INC^{\text{BANK}} - \text{ex}^{\text{rate}\langle r \rangle} TBANKROW^{\langle r \rangle} = 0 \quad (15.71)$$

$$r \in ROW: \quad -EXP^{\text{ROW}\langle r \rangle} + EXPORT^{\text{ROW}\langle r \rangle} + TRAN^{\langle r \rangle} = 0 \quad (15.72)$$

$$r \in ROW: \quad EXP^{\text{ROW}\langle r \rangle} - INC^{\text{ROW}\langle r \rangle} + SAV^{\langle r \rangle} = 0 \quad (15.73)$$

$$r \in ROW: \quad IMPORT^{\text{ROW}\langle r \rangle} - INC^{\text{ROW}\langle r \rangle} + \text{ex}^{\text{rate}\langle r \rangle} \left( TBANKROW^{\langle r \rangle} + TFIRMROW^{\langle r \rangle} + TGOVROW^{\langle r \rangle} + \sum_{h \in HHD} \text{scale}^{\langle h \rangle} TROW^{\langle h, r \rangle} \right) = 0 \quad (15.74)$$

$$r \in ROW: \quad -TRAN^{(r)} + TROWFIRM^{(r)} + TROWBANK^{(r)} + TROWGOV^{(r)} + \sum_{h \in HHD} scale^{(h)} TROWH^{(r,h)} = 0 \quad (15.75)$$

$$r \in ROW: \quad h \in HHD: \quad t^{rh(r,h)} EXP^{ROW(r)} - scale^{(h)} TROWH^{(r,h)} = 0 \quad (15.76)$$

$$s \in SEC: \quad dgo^{data(s)} - p^{cons(s)} D^{GOV(s)} = 0 \quad (15.77)$$

$$s \in SEC: \quad -p^{cons(s)} + p^{market(s)} \left(1 + excise^{(s)}\right) \left(1 + ut^{(s)}\right) = 0 \quad (15.78)$$

$$s \in SEC: \quad -p^{int(s)} + p^{market(s)} \left(1 + excise^{(s)}\right) = 0 \quad (15.79)$$

$$s \in SEC: \quad -p^{exp(s)} + \alpha^{prod^e(s)} \theta^y(s) p^{(s)} EXPORT^{f(s)} \sigma^{fprod(s)-1} \left(1 + \sigma^{fprod(s)}\right) \left( \alpha^{prod^h(s)} Y^{HOME(s)} \sigma^{fprod(s)-1} \left(1 + \sigma^{fprod(s)}\right) + \alpha^{prod^e(s)} EXPORT^{f(s)} \sigma^{fprod(s)-1} \left(1 + \sigma^{fprod(s)}\right) \right)^{-1 + \sigma^{fprod(s)}} \quad (15.80)$$

$$s \in SEC: \quad -p^{home(s)} + \alpha^{prod^h(s)} \theta^y(s) p^{(s)} Y^{HOME(s)} \sigma^{fprod(s)-1} \left(1 + \sigma^{fprod(s)}\right) \left( \alpha^{prod^h(s)} Y^{HOME(s)} \sigma^{fprod(s)-1} \left(1 + \sigma^{fprod(s)}\right) + \alpha^{prod^e(s)} EXPORT^{f(s)} \sigma^{fprod(s)-1} \left(1 + \sigma^{fprod(s)}\right) \right)^{-1 + \sigma^{fprod(s)}} \quad (15.81)$$

$$s \in SEC: \quad -p^{home(s)} + \alpha^{arm^h(s)} \theta^{arm(s)} p^{arm(s)} Y^{HOME^a(s)} \sigma^{arm(s)-1} \left(-1 + \sigma^{arm(s)}\right) \left( \alpha^{arm^h(s)} Y^{HOME^a(s)} \sigma^{arm(s)-1} \left(-1 + \sigma^{arm(s)}\right) + \alpha^{arm^i(s)} IMPORT^{a(s)} \sigma^{arm(s)-1} \left(-1 + \sigma^{arm(s)}\right) \right)^{-1 + \sigma^{arm(s)}} \quad (15.82)$$

$$s \in SEC: \quad -p^{imp(s)} + \alpha^{arm^i(s)} \theta^{arm(s)} p^{arm(s)} IMPORT^{a(s)} \sigma^{arm(s)-1} \left(-1 + \sigma^{arm(s)}\right) \left( \alpha^{arm^h(s)} Y^{HOME^a(s)} \sigma^{arm(s)-1} \left(-1 + \sigma^{arm(s)}\right) + \alpha^{arm^i(s)} IMPORT^{a(s)} \sigma^{arm(s)-1} \left(-1 + \sigma^{arm(s)}\right) \right)^{-1 + \sigma^{arm(s)}} \quad (15.83)$$

$$s \in SEC: \quad -ARM^{(s)} + \theta^{arm(s)} \left( \alpha^{arm^h(s)} Y^{HOME^a(s)} \sigma^{arm(s)-1} \left(-1 + \sigma^{arm(s)}\right) + \alpha^{arm^i(s)} IMPORT^{a(s)} \sigma^{arm(s)-1} \left(-1 + \sigma^{arm(s)}\right) \right) \sigma^{arm(s)} \left(-1 + \sigma^{arm(s)}\right)^{-1} = 0 \quad (15.84)$$

$$s \in SEC: \quad -EXPORT^{f(s)} + EXPORT^{(s)} = 0 \quad (15.85)$$

$$s \in SEC: \quad -EXPORT^{(s)} + \theta^{exp(s)} \left( \sum_{r \in ROW} \alpha^{exp(r,s)} \left( am^{exp(r)} EXP^{(r,s)} \right) \sigma^{exp(s)-1} \left(1 + \sigma^{exp(s)}\right) \right) \sigma^{exp(s)} \left(1 + \sigma^{exp(s)}\right)^{-1} = 0 \quad (15.86)$$

$$s \in SEC: \quad -EXCISE^{(s)} + excise^{(s)} p^{market(s)} \left( D^{GOV(s)} + INV^{(s)} + \sum_{h \in HHD} scale^{(h)} D^{(s,h)} + \sum_{si \in SEC} X^{(s,si)} \right) = 0 \quad (15.87)$$

$$s \in SEC: \quad -IMPORT^{a(s)} + IMPORT^{(s)} = 0 \quad (15.88)$$

$$s \in SEC: \quad -IMPORT^{(s)} + \theta^{imp(s)} \left( \sum_{r \in ROW} \alpha^{imp(r,s)} \left( am^{imp(r)} IMP^{(r,s)} \right)^{\sigma^{imp(s)} - 1} (-1 + \sigma^{imp(s)}) \right)^{\sigma^{imp(s)} (-1 + \sigma^{imp(s)})^{-1}} = 0 \quad (15.89)$$

$$s \in SEC: \quad -SUBS^{(s)} + sub^{rate(s)} \left( p^k K^{(s)} (1 + k^{tax}) + p^l L^{(s)} (1 + l^{tax}) + \sum_{\tilde{s} \in SEC} p^{int(\tilde{s})} X^{(\tilde{s},s)} \right) = 0 \quad (15.90)$$

$$s \in SEC: \quad -SUBP^{(s)} + subP^{(s)} ARM^{(s)} = 0 \quad (15.91)$$

$$s \in SEC: \quad -TAXS^{(s)} + tax^{rate(s)} \left( p^k K^{(s)} (1 + k^{tax}) + p^l L^{(s)} (1 + l^{tax}) + \sum_{\tilde{s} \in SEC} p^{int(\tilde{s})} X^{(\tilde{s},s)} \right) = 0 \quad (15.92)$$

$$s \in SEC: \quad -VAT^{(s)} + vat^{(s)} p^{market(s)} \left( 1 + excise^{(s)} \right) \left( D^{GOV(s)} + INV^{(s)} + \sum_{h \in HHD} scale^{(h)} D^{(s,h)} \right) = 0 \quad (15.93)$$

$$s \in SEC: \quad -Y^{(s)} + Y^{VA(s)} = 0 \quad (15.94)$$

$$s \in SEC: \quad Y^{(s)} - Y^f{}^{(s)} = 0 \quad (15.95)$$

$$s \in SEC: \quad -Y^{VA(s)} + Y^{INT(s)} = 0 \quad (15.96)$$

$$s \in SEC: \quad -Y^{VA(s)} + \gamma^{yva(s)} K^{(s)\beta^k(s)} L^{(s)\beta^l(s)} = 0 \quad (15.97)$$

$$s \in SEC: \quad -Y^{HOME^a(s)} + Y^{HOME(s)} = 0 \quad (15.98)$$

$$s \in SEC: \quad -Y^f{}^{(s)} + \theta^{y(s)} \left( \alpha^{prod^h(s)} Y^{HOME(s)\sigma^{fProd(s)} - 1} (1 + \sigma^{fProd(s)}) + \alpha^{prod^e(s)} EXPORT^f{}^{(s)\sigma^{fProd(s)} - 1} (1 + \sigma^{fProd(s)}) \right)^{\sigma^{fProd(s)} (1 + \sigma^{fProd(s)})^{-1}} = 0 \quad (15.99)$$

$$s \in SEC: \quad iw^{(s)} INV - p^{cons(s)} INV^{(s)} = 0 \quad (15.100)$$

$$s \in SEC: \quad -p^k (1 + k^{tax}) \left( 1 - sub^{rate(s)} + tax^{rate(s)} \right) + \beta^k(s) \gamma^{yva(s)} \left( p^{(s)} + \sum_{\tilde{s} \in SEC} \beta^{x(\tilde{s},s)} \lambda^{PRODUCTIONOFGOODS^4(s,\tilde{s})} \right) K^{(s)-1+\beta^k(s)} L^{(s)\beta^l(s)} = 0 \quad (15.101)$$

$$s \in SEC: \quad -p^l (1 + l^{tax}) \left( 1 - sub^{rate(s)} + tax^{rate(s)} \right) + \beta^l(s) \gamma^{yva(s)} \left( p^{(s)} + \sum_{\tilde{s} \in SEC} \beta^{x(\tilde{s},s)} \lambda^{PRODUCTIONOFGOODS^4(s,\tilde{s})} \right) K^{(s)\beta^k(s)} L^{(s)-1+\beta^l(s)} = 0 \quad (15.102)$$

$$s \in SEC: \quad -subP^{(s)} + p^{arm(s)} - p^{market(s)} = 0 \quad (15.103)$$

$$s \in SEC: \quad \pi^{(s)} - p^{(s)} Y^{(s)} + \left( 1 - sub^{rate(s)} + tax^{rate(s)} \right) \left( p^k K^{(s)} (1 + k^{tax}) + p^l L^{(s)} (1 + l^{tax}) + \sum_{\tilde{s} \in SEC} p^{int(\tilde{s})} X^{(\tilde{s},s)} \right) = 0 \quad (15.104)$$

$$s \in SEC: \quad EXCISE^{(s)} - TAX^{(s)} + VAT^{(s)} = 0 \quad (15.105)$$

$$s \in SEC: \quad \Pi^{EXP^{(s)}} - p^{exp^{(s)}} EXPORT^{(s)} + \sum_{r \in ROW} p^{for^{(r)}} EXP^{(r,s)} = 0 \quad (15.106)$$

$$s \in SEC: \quad \Pi^{IMP^{(s)}} - p^{imp^{(s)}} IMPORT^{(s)} + \sum_{r \in ROW} p^{for^{(r)}} ex^{rate^{(r)}} IMP^{(r,s)} \left(1 + im^{tax^{(r,s)}}\right) = 0 \quad (15.107)$$

$$s \in SEC: \quad \Pi^Y^{(s)} - p^{(s)} Y^f^{(s)} + p^{exp^{(s)}} EXPORT^f^{(s)} + p^{home^{(s)}} Y^{HOME^{(s)}} = 0 \quad (15.108)$$

$$s \in SEC: \quad \Pi^{ARM^{(s)}} + p^{home^{(s)}} Y^{HOME^a^{(s)}} + p^{imp^{(s)}} IMPORT^a^{(s)} - p^{arm^{(s)}} ARM^{(s)} = 0 \quad (15.109)$$

$$s \in SEC: \quad -ARM^{(s)} + D^{GOV^{(s)}} + INV^{(s)} + \sum_{h \in HHD} scale^{(h)} D^{(s,h)} + \sum_{\dot{s} \in SEC} X^{(s,\dot{s})} = 0 \quad (15.110)$$

$$s \in SEC: \quad r \in ROW: \quad -p^{for^{(r)}} + \alpha^{exp^{(r,s)}} am^{exp^{(r)}} \theta^{exp^{(s)}} p^{exp^{(s)}} \left( am^{exp^{(r)}} EXP^{(r,s)} \right)^{-1 + \sigma^{exp^{(s)}}} \left(1 + \sigma^{exp^{(s)}}\right) \left( \sum_{r \in ROW} \alpha^{exp^{(r,s)}} \left( am^{exp^{(r)}} EXP^{(r,s)} \right)^{\sigma^{exp^{(s)}}} \left(1 + \sigma^{exp^{(s)}}\right) \right)^{-1 + \sigma^{exp^{(s)}}} \left(1 + \sigma^{exp^{(s)}}\right) \quad (15.111)$$

$$s \in SEC: \quad r \in ROW: \quad -p^{for^{(r)}} ex^{rate^{(r)}} \left(1 + im^{tax^{(r,s)}}\right) + \alpha^{imp^{(r,s)}} am^{imp^{(r)}} \theta^{imp^{(s)}} p^{imp^{(s)}} \left( am^{imp^{(r)}} IMP^{(r,s)} \right)^{-1 + \sigma^{imp^{(s)}}} \left(-1 + \sigma^{imp^{(s)}}\right) \left( \sum_{r \in ROW} \alpha^{imp^{(r,s)}} \left( am^{imp^{(r)}} IMP^{(r,s)} \right)^{\sigma^{imp^{(s)}}} \right)^{-1 + \sigma^{imp^{(s)}}} \quad (15.112)$$

$$s \in SEC: \quad \dot{s} \in SEC: \quad -\lambda^{PRODUCTION^{OF\ GOODS^4}}^{(s,\dot{s})} - p^{int^{(\dot{s})}} \left(1 - sub^{rate^{(s)}} + tax^{rate^{(s)}}\right) = 0 \quad (15.113)$$

$$s \in SEC: \quad \dot{s} \in SEC: \quad -X^{(\dot{s},s)} + \beta^{x^{(\dot{s},s)}} Y^{INT^{(s)}} = 0 \quad (15.114)$$

## 16 Equilibrium relationships (after expansion and reduction)

$$-UNEMP^{(01)} = 0 \quad (16.1)$$

$$-UNEMP^{(02)} = 0 \quad (16.2)$$

$$-UNEMP^{(03)} = 0 \quad (16.3)$$

$$-UNEMP^{(04)} = 0 \quad (16.4)$$

$$-UNEMP^{(05)} = 0 \quad (16.5)$$

$$-UNEMP^{(06)} = 0 \quad (16.6)$$

$$-UNEMP^{(07)} = 0 \quad (16.7)$$

$$-UNEMP^{(08)} = 0 \quad (16.8)$$

$$-UNEMP^{(09)} = 0 \quad (16.9)$$

$$-UNEMP^{(10)} = 0 \quad (16.10)$$

$$1 - ex^{\text{rate}(\text{eu})} = 0 \quad (16.11)$$

$$1 - ex^{\text{rate}(\text{neu})} = 0 \quad (16.12)$$

$$1 - \left( ARM^{(A)} + ARM^{(B)} + ARM^{(C)} + ARM^{(D)} + ARM^{(E)} + ARM^{(F)} + ARM^{(G)} + ARM^{(H)} + ARM^{(I)} + ARM^{(J)} + ARM^{(K)} \right)^{-1} \left( p^{(A)} ARM^{(A)} + p^{(B)} ARM^{(B)} + p^{(C)} ARM^{(C)} + p^{(D)} ARM^{(D)} + \dots \right) = 0 \quad (16.13)$$

$$k^{\text{total}^{\text{data}}} - KS = 0 \quad (16.14)$$

$$tgv\text{firm}^{\text{data}} - TGOVFIRM = 0 \quad (16.15)$$

$$tgv\text{bank}^{\text{data}} - TGOVBANK = 0 \quad (16.16)$$

$$dgv^{\text{data}^{(A)}} - p^{\text{cons}^{(A)}} D^{\text{GOV}^{(A)}} = 0 \quad (16.17)$$

$$dgv^{\text{data}^{(B)}} - p^{\text{cons}^{(B)}} D^{\text{GOV}^{(B)}} = 0 \quad (16.18)$$

$$dgv^{\text{data}^{(C)}} - p^{\text{cons}^{(C)}} D^{\text{GOV}^{(C)}} = 0 \quad (16.19)$$

$$dgv^{\text{data}^{(D)}} - p^{\text{cons}^{(D)}} D^{\text{GOV}^{(D)}} = 0 \quad (16.20)$$

$$dgv^{\text{data}^{(E)}} - p^{\text{cons}^{(E)}} D^{\text{GOV}^{(E)}} = 0 \quad (16.21)$$

$$dgv^{\text{data}^{(F)}} - p^{\text{cons}^{(F)}} D^{\text{GOV}^{(F)}} = 0 \quad (16.22)$$

$$dgv^{\text{data}^{(G)}} - p^{\text{cons}^{(G)}} D^{\text{GOV}^{(G)}} = 0 \quad (16.23)$$

$$dgv^{\text{data}^{(H)}} - p^{\text{cons}^{(H)}} D^{\text{GOV}^{(H)}} = 0 \quad (16.24)$$

$$dgv^{\text{data}^{(I)}} - p^{\text{cons}^{(I)}} D^{\text{GOV}^{(I)}} = 0 \quad (16.25)$$

$$dgv^{\text{data}^{(J)}} - p^{\text{cons}^{(J)}} D^{\text{GOV}^{(J)}} = 0 \quad (16.26)$$

$$dgv^{\text{data}^{(K)}} - p^{\text{cons}^{(K)}} D^{\text{GOV}^{(K)}} = 0 \quad (16.27)$$

$$le^{(01)} - scale^{(01)} \left( LEIS^{(01)} + LL^{(01)} \right) = 0 \quad (16.28)$$

$$le^{(02)} - scale^{(02)} \left( LEIS^{(02)} + LL^{(02)} \right) = 0 \quad (16.29)$$

$$le^{(03)} - scale^{(03)} \left( LEIS^{(03)} + LL^{(03)} \right) = 0 \quad (16.30)$$

$$le^{(04)} - scale^{(04)} \left( LEIS^{(04)} + LL^{(04)} \right) = 0 \quad (16.31)$$





$$-p^{\text{for} \langle \text{neu} \rangle} + \alpha^{\text{exp} \langle \text{neu}, \text{G} \rangle} am^{\text{exp} \langle \text{neu} \rangle} \theta^{\text{exp} \langle \text{G} \rangle} p^{\text{exp} \langle \text{G} \rangle} \left( \alpha^{\text{exp} \langle \text{eu}, \text{G} \rangle} \left( am^{\text{exp} \langle \text{eu} \rangle} EXP^{\langle \text{eu}, \text{G} \rangle} \right)^{\sigma^{\text{exp} \langle \text{G} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{G} \rangle}) + \alpha^{\text{exp} \langle \text{neu}, \text{G} \rangle} \left( am^{\text{exp} \langle \text{neu} \rangle} EXP^{\langle \text{neu}, \text{G} \rangle} \right)^{\sigma^{\text{exp} \langle \text{G} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{G} \rangle}) \right)^{-1 + \sigma^{\text{exp} \langle \text{G} \rangle} (1 + \sigma^{\text{exp} \langle \text{G} \rangle})} \quad (16.55)$$

$$-p^{\text{for} \langle \text{neu} \rangle} + \alpha^{\text{exp} \langle \text{neu}, \text{H} \rangle} am^{\text{exp} \langle \text{neu} \rangle} \theta^{\text{exp} \langle \text{H} \rangle} p^{\text{exp} \langle \text{H} \rangle} \left( \alpha^{\text{exp} \langle \text{eu}, \text{H} \rangle} \left( am^{\text{exp} \langle \text{eu} \rangle} EXP^{\langle \text{eu}, \text{H} \rangle} \right)^{\sigma^{\text{exp} \langle \text{H} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{H} \rangle}) + \alpha^{\text{exp} \langle \text{neu}, \text{H} \rangle} \left( am^{\text{exp} \langle \text{neu} \rangle} EXP^{\langle \text{neu}, \text{H} \rangle} \right)^{\sigma^{\text{exp} \langle \text{H} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{H} \rangle}) \right)^{-1 + \sigma^{\text{exp} \langle \text{H} \rangle} (1 + \sigma^{\text{exp} \langle \text{H} \rangle})} \quad (16.56)$$

$$-p^{\text{for} \langle \text{neu} \rangle} + \alpha^{\text{exp} \langle \text{neu}, \text{I} \rangle} am^{\text{exp} \langle \text{neu} \rangle} \theta^{\text{exp} \langle \text{I} \rangle} p^{\text{exp} \langle \text{I} \rangle} \left( \alpha^{\text{exp} \langle \text{eu}, \text{I} \rangle} \left( am^{\text{exp} \langle \text{eu} \rangle} EXP^{\langle \text{eu}, \text{I} \rangle} \right)^{\sigma^{\text{exp} \langle \text{I} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{I} \rangle}) + \alpha^{\text{exp} \langle \text{neu}, \text{I} \rangle} \left( am^{\text{exp} \langle \text{neu} \rangle} EXP^{\langle \text{neu}, \text{I} \rangle} \right)^{\sigma^{\text{exp} \langle \text{I} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{I} \rangle}) \right)^{-1 + \sigma^{\text{exp} \langle \text{I} \rangle} (1 + \sigma^{\text{exp} \langle \text{I} \rangle})} (am^{\text{exp} \langle \text{neu} \rangle}) \quad (16.57)$$

$$-p^{\text{for} \langle \text{neu} \rangle} + \alpha^{\text{exp} \langle \text{neu}, \text{J} \rangle} am^{\text{exp} \langle \text{neu} \rangle} \theta^{\text{exp} \langle \text{J} \rangle} p^{\text{exp} \langle \text{J} \rangle} \left( \alpha^{\text{exp} \langle \text{eu}, \text{J} \rangle} \left( am^{\text{exp} \langle \text{eu} \rangle} EXP^{\langle \text{eu}, \text{J} \rangle} \right)^{\sigma^{\text{exp} \langle \text{J} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{J} \rangle}) + \alpha^{\text{exp} \langle \text{neu}, \text{J} \rangle} \left( am^{\text{exp} \langle \text{neu} \rangle} EXP^{\langle \text{neu}, \text{J} \rangle} \right)^{\sigma^{\text{exp} \langle \text{J} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{J} \rangle}) \right)^{-1 + \sigma^{\text{exp} \langle \text{J} \rangle} (1 + \sigma^{\text{exp} \langle \text{J} \rangle})} (am^{\text{exp} \langle \text{neu} \rangle}) \quad (16.58)$$

$$-p^{\text{for} \langle \text{neu} \rangle} + \alpha^{\text{exp} \langle \text{neu}, \text{K} \rangle} am^{\text{exp} \langle \text{neu} \rangle} \theta^{\text{exp} \langle \text{K} \rangle} p^{\text{exp} \langle \text{K} \rangle} \left( \alpha^{\text{exp} \langle \text{eu}, \text{K} \rangle} \left( am^{\text{exp} \langle \text{eu} \rangle} EXP^{\langle \text{eu}, \text{K} \rangle} \right)^{\sigma^{\text{exp} \langle \text{K} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{K} \rangle}) + \alpha^{\text{exp} \langle \text{neu}, \text{K} \rangle} \left( am^{\text{exp} \langle \text{neu} \rangle} EXP^{\langle \text{neu}, \text{K} \rangle} \right)^{\sigma^{\text{exp} \langle \text{K} \rangle} - 1} (1 + \sigma^{\text{exp} \langle \text{K} \rangle}) \right)^{-1 + \sigma^{\text{exp} \langle \text{K} \rangle} (1 + \sigma^{\text{exp} \langle \text{K} \rangle})} \quad (16.59)$$

$$tgvrow^{\text{data} \langle \text{eu} \rangle} - ex^{\text{rate} \langle \text{eu} \rangle} TGOVROW^{\langle \text{eu} \rangle} = 0 \quad (16.60)$$

$$tgvrow^{\text{data} \langle \text{neu} \rangle} - ex^{\text{rate} \langle \text{neu} \rangle} TGOVROW^{\langle \text{neu} \rangle} = 0 \quad (16.61)$$

$$-BANKTAX + \text{bnk}^{\text{tax}} BTINC^{\text{BANK}} = 0 \quad (16.62)$$

$$-FIRMTAX + \text{firm}^{\text{tax}} BTINC^{\text{FIRM}} = 0 \quad (16.63)$$

$$-INC^{\text{FIRM}} + BTINC^{\text{FIRM}} (1 - \text{firm}^{\text{tax}}) = 0 \quad (16.64)$$

$$-INC^{\text{BANK}} + BTINC^{\text{BANK}} (1 - \text{bnk}^{\text{tax}}) = 0 \quad (16.65)$$

$$-K^{\text{TAX}} + k^{\text{tax}} p^k \left( K^{\langle \text{A} \rangle} + K^{\langle \text{B} \rangle} + K^{\langle \text{C} \rangle} + K^{\langle \text{D} \rangle} + K^{\langle \text{E} \rangle} + K^{\langle \text{F} \rangle} + K^{\langle \text{G} \rangle} + K^{\langle \text{H} \rangle} + K^{\langle \text{I} \rangle} + K^{\langle \text{J} \rangle} + K^{\langle \text{K} \rangle} \right) = 0 \quad (16.66)$$

$$-K^{\text{FIRM}} + \alpha w^f KS = 0 \quad (16.67)$$

$$-K^{\text{BANK}} + \alpha w^b KS = 0 \quad (16.68)$$

$$-L^{\text{TAX}} + l^{\text{tax}} p^l \left( L^{\langle \text{A} \rangle} + L^{\langle \text{B} \rangle} + L^{\langle \text{C} \rangle} + L^{\langle \text{D} \rangle} + L^{\langle \text{E} \rangle} + L^{\langle \text{F} \rangle} + L^{\langle \text{G} \rangle} + L^{\langle \text{H} \rangle} + L^{\langle \text{I} \rangle} + L^{\langle \text{J} \rangle} + L^{\langle \text{K} \rangle} \right) = 0 \quad (16.69)$$

$$-TBANKFIRM + \alpha w^f INC^{\text{BANK}} = 0 \quad (16.70)$$

$$-TFIRMBANK + \alpha w^b INC^{\text{FIRM}} = 0 \quad (16.71)$$

$$-p^{\text{cons} \langle \text{A} \rangle} + p^{\text{market} \langle \text{A} \rangle} \left( 1 + \text{exise}^{\langle \text{A} \rangle} \right) \left( 1 + \text{wt}^{\langle \text{A} \rangle} \right) = 0 \quad (16.72)$$















$$-ARM^{(B)} + \theta^{arm(B)} \left( \alpha^{arm^h(B)} Y^{HOME(B)} \sigma^{arm(B)-1} (-1 + \sigma^{arm(B)}) + \alpha^{arm^i(B)} IMPORT^{(B)} \sigma^{arm(B)-1} (-1 + \sigma^{arm(B)}) \right) \sigma^{arm(B)} (-1 + \sigma^{arm(B)})^{-1} = 0 \quad (16.139)$$

$$-ARM^{(C)} + \theta^{arm(C)} \left( \alpha^{arm^h(C)} Y^{HOME(C)} \sigma^{arm(C)-1} (-1 + \sigma^{arm(C)}) + \alpha^{arm^i(C)} IMPORT^{(C)} \sigma^{arm(C)-1} (-1 + \sigma^{arm(C)}) \right) \sigma^{arm(C)} (-1 + \sigma^{arm(C)})^{-1} = 0 \quad (16.140)$$

$$-ARM^{(D)} + \theta^{arm(D)} \left( \alpha^{arm^h(D)} Y^{HOME(D)} \sigma^{arm(D)-1} (-1 + \sigma^{arm(D)}) + \alpha^{arm^i(D)} IMPORT^{(D)} \sigma^{arm(D)-1} (-1 + \sigma^{arm(D)}) \right) \sigma^{arm(D)} (-1 + \sigma^{arm(D)})^{-1} = 0 \quad (16.141)$$

$$-ARM^{(E)} + \theta^{arm(E)} \left( \alpha^{arm^h(E)} Y^{HOME(E)} \sigma^{arm(E)-1} (-1 + \sigma^{arm(E)}) + \alpha^{arm^i(E)} IMPORT^{(E)} \sigma^{arm(E)-1} (-1 + \sigma^{arm(E)}) \right) \sigma^{arm(E)} (-1 + \sigma^{arm(E)})^{-1} = 0 \quad (16.142)$$

$$-ARM^{(F)} + \theta^{arm(F)} \left( \alpha^{arm^h(F)} Y^{HOME(F)} \sigma^{arm(F)-1} (-1 + \sigma^{arm(F)}) + \alpha^{arm^i(F)} IMPORT^{(F)} \sigma^{arm(F)-1} (-1 + \sigma^{arm(F)}) \right) \sigma^{arm(F)} (-1 + \sigma^{arm(F)})^{-1} = 0 \quad (16.143)$$

$$-ARM^{(G)} + \theta^{arm(G)} \left( \alpha^{arm^h(G)} Y^{HOME(G)} \sigma^{arm(G)-1} (-1 + \sigma^{arm(G)}) + \alpha^{arm^i(G)} IMPORT^{(G)} \sigma^{arm(G)-1} (-1 + \sigma^{arm(G)}) \right) \sigma^{arm(G)} (-1 + \sigma^{arm(G)})^{-1} = 0 \quad (16.144)$$

$$-ARM^{(H)} + \theta^{arm(H)} \left( \alpha^{arm^h(H)} Y^{HOME(H)} \sigma^{arm(H)-1} (-1 + \sigma^{arm(H)}) + \alpha^{arm^i(H)} IMPORT^{(H)} \sigma^{arm(H)-1} (-1 + \sigma^{arm(H)}) \right) \sigma^{arm(H)} (-1 + \sigma^{arm(H)})^{-1} = 0 \quad (16.145)$$

$$-ARM^{(I)} + \theta^{arm(I)} \left( \alpha^{arm^h(I)} Y^{HOME(I)} \sigma^{arm(I)-1} (-1 + \sigma^{arm(I)}) + \alpha^{arm^i(I)} IMPORT^{(I)} \sigma^{arm(I)-1} (-1 + \sigma^{arm(I)}) \right) \sigma^{arm(I)} (-1 + \sigma^{arm(I)})^{-1} = 0 \quad (16.146)$$

$$-ARM^{(J)} + \theta^{arm(J)} \left( \alpha^{arm^h(J)} Y^{HOME(J)} \sigma^{arm(J)-1} (-1 + \sigma^{arm(J)}) + \alpha^{arm^i(J)} IMPORT^{(J)} \sigma^{arm(J)-1} (-1 + \sigma^{arm(J)}) \right) \sigma^{arm(J)} (-1 + \sigma^{arm(J)})^{-1} = 0 \quad (16.147)$$

$$-ARM^{(K)} + \theta^{arm(K)} \left( \alpha^{arm^h(K)} Y^{HOME(K)} \sigma^{arm(K)-1} (-1 + \sigma^{arm(K)}) + \alpha^{arm^i(K)} IMPORT^{(K)} \sigma^{arm(K)-1} (-1 + \sigma^{arm(K)}) \right) \sigma^{arm(K)} (-1 + \sigma^{arm(K)})^{-1} = 0 \quad (16.148)$$

$$-DEM^{(01)} + \theta^{dem(01)} \left( \alpha^{(A,01)} D^{(A,01)} \omega^{-1} (-1 + \omega) + \alpha^{(B,01)} D^{(B,01)} \omega^{-1} (-1 + \omega) + \alpha^{(C,01)} D^{(C,01)} \omega^{-1} (-1 + \omega) + \alpha^{(D,01)} D^{(D,01)} \omega^{-1} (-1 + \omega) + \alpha^{(E,01)} D^{(E,01)} \omega^{-1} (-1 + \omega) + \alpha^{(F,01)} D^{(F,01)} \omega^{-1} (-1 + \omega) \right) = 0 \quad (16.149)$$





$$-EXPORT^{(C)} + \theta^{\exp(C)} \left( \alpha^{\exp(eu,C)} \left( am^{\exp(eu)} EXP^{(eu,C)} \right)^{\sigma^{\exp(C)-1} (1+\sigma^{\exp(C)})} + \alpha^{\exp(neu,C)} \left( am^{\exp(neu)} EXP^{(neu,C)} \right)^{\sigma^{\exp(C)-1} (1+\sigma^{\exp(C)})} \right)^{\sigma^{\exp(C)} (1+\sigma^{\exp(C)})^{-1}} = 0 \quad (16.161)$$

$$-EXPORT^{(D)} + \theta^{\exp(D)} \left( \alpha^{\exp(eu,D)} \left( am^{\exp(eu)} EXP^{(eu,D)} \right)^{\sigma^{\exp(D)-1} (1+\sigma^{\exp(D)})} + \alpha^{\exp(neu,D)} \left( am^{\exp(neu)} EXP^{(neu,D)} \right)^{\sigma^{\exp(D)-1} (1+\sigma^{\exp(D)})} \right)^{\sigma^{\exp(D)} (1+\sigma^{\exp(D)})^{-1}} = 0 \quad (16.162)$$

$$-EXPORT^{(E)} + \theta^{\exp(E)} \left( \alpha^{\exp(eu,E)} \left( am^{\exp(eu)} EXP^{(eu,E)} \right)^{\sigma^{\exp(E)-1} (1+\sigma^{\exp(E)})} + \alpha^{\exp(neu,E)} \left( am^{\exp(neu)} EXP^{(neu,E)} \right)^{\sigma^{\exp(E)-1} (1+\sigma^{\exp(E)})} \right)^{\sigma^{\exp(E)} (1+\sigma^{\exp(E)})^{-1}} = 0 \quad (16.163)$$

$$-EXPORT^{(F)} + \theta^{\exp(F)} \left( \alpha^{\exp(eu,F)} \left( am^{\exp(eu)} EXP^{(eu,F)} \right)^{\sigma^{\exp(F)-1} (1+\sigma^{\exp(F)})} + \alpha^{\exp(neu,F)} \left( am^{\exp(neu)} EXP^{(neu,F)} \right)^{\sigma^{\exp(F)-1} (1+\sigma^{\exp(F)})} \right)^{\sigma^{\exp(F)} (1+\sigma^{\exp(F)})^{-1}} = 0 \quad (16.164)$$

$$-EXPORT^{(G)} + \theta^{\exp(G)} \left( \alpha^{\exp(eu,G)} \left( am^{\exp(eu)} EXP^{(eu,G)} \right)^{\sigma^{\exp(G)-1} (1+\sigma^{\exp(G)})} + \alpha^{\exp(neu,G)} \left( am^{\exp(neu)} EXP^{(neu,G)} \right)^{\sigma^{\exp(G)-1} (1+\sigma^{\exp(G)})} \right)^{\sigma^{\exp(G)} (1+\sigma^{\exp(G)})^{-1}} = 0 \quad (16.165)$$

$$-EXPORT^{(H)} + \theta^{\exp(H)} \left( \alpha^{\exp(eu,H)} \left( am^{\exp(eu)} EXP^{(eu,H)} \right)^{\sigma^{\exp(H)-1} (1+\sigma^{\exp(H)})} + \alpha^{\exp(neu,H)} \left( am^{\exp(neu)} EXP^{(neu,H)} \right)^{\sigma^{\exp(H)-1} (1+\sigma^{\exp(H)})} \right)^{\sigma^{\exp(H)} (1+\sigma^{\exp(H)})^{-1}} = 0 \quad (16.166)$$

$$-EXPORT^{(I)} + \theta^{\exp(I)} \left( \alpha^{\exp(eu,I)} \left( am^{\exp(eu)} EXP^{(eu,I)} \right)^{\sigma^{\exp(I)-1} (1+\sigma^{\exp(I)})} + \alpha^{\exp(neu,I)} \left( am^{\exp(neu)} EXP^{(neu,I)} \right)^{\sigma^{\exp(I)-1} (1+\sigma^{\exp(I)})} \right)^{\sigma^{\exp(I)} (1+\sigma^{\exp(I)})^{-1}} = 0 \quad (16.167)$$

$$-EXPORT^{(J)} + \theta^{\exp(J)} \left( \alpha^{\exp(eu,J)} \left( am^{\exp(eu)} EXP^{(eu,J)} \right)^{\sigma^{\exp(J)-1} (1+\sigma^{\exp(J)})} + \alpha^{\exp(neu,J)} \left( am^{\exp(neu)} EXP^{(neu,J)} \right)^{\sigma^{\exp(J)-1} (1+\sigma^{\exp(J)})} \right)^{\sigma^{\exp(J)} (1+\sigma^{\exp(J)})^{-1}} = 0 \quad (16.168)$$

$$-EXPORT^{(K)} + \theta^{\exp(K)} \left( \alpha^{\exp(eu,K)} \left( am^{\exp(eu)} EXP^{(eu,K)} \right)^{\sigma^{\exp(K)-1} (1+\sigma^{\exp(K)})} + \alpha^{\exp(neu,K)} \left( am^{\exp(neu)} EXP^{(neu,K)} \right)^{\sigma^{\exp(K)-1} (1+\sigma^{\exp(K)})} \right)^{\sigma^{\exp(K)} (1+\sigma^{\exp(K)})^{-1}} = 0 \quad (16.169)$$

$$-EXCISE^{(A)} + \text{excise}^{(A)} p^{\text{market}^{(A)}} \left( D^{\text{GOV}^{(A)}} + INV^{(A)} + X^{(A,A)} + X^{(A,B)} + X^{(A,C)} + X^{(A,D)} + X^{(A,E)} + X^{(A,F)} + X^{(A,G)} + X^{(A,H)} + X^{(A,I)} + X^{(A,J)} + X^{(A,K)} + \text{scale}^{(01)} D^{(A,01)} \right) \quad (16.170)$$

$$-EXCISE^{(B)} + \text{excise}^{(B)} p^{\text{market}^{(B)}} \left( D^{\text{GOV}^{(B)}} + INV^{(B)} + X^{(B,A)} + X^{(B,B)} + X^{(B,C)} + X^{(B,D)} + X^{(B,E)} + X^{(B,F)} + X^{(B,G)} + X^{(B,H)} + X^{(B,I)} + X^{(B,J)} + X^{(B,K)} + \text{scale}^{(01)} D^{(B,01)} \right) \quad (16.171)$$

$$-EXCISE^{(C)} + \text{excise}^{(C)} p^{\text{market}^{(C)}} \left( D^{\text{GOV}^{(C)}} + INV^{(C)} + X^{(C,A)} + X^{(C,B)} + X^{(C,C)} + X^{(C,D)} + X^{(C,E)} + X^{(C,F)} + X^{(C,G)} + X^{(C,H)} + X^{(C,I)} + X^{(C,J)} + X^{(C,K)} + \text{scale}^{(01)} D^{(C,01)} + \right. \\ \left. \right) \quad (16.172)$$

$$-EXCISE^{(D)} + \text{excise}^{(D)} p^{\text{market}^{(D)}} \left( D^{\text{GOV}^{(D)}} + INV^{(D)} + X^{(D,A)} + X^{(D,B)} + X^{(D,C)} + X^{(D,D)} + X^{(D,E)} + X^{(D,F)} + X^{(D,G)} + X^{(D,H)} + X^{(D,I)} + X^{(D,J)} + X^{(D,K)} + \text{scale}^{(01)} D^{(D,01)} + \right. \\ \left. \right) \quad (16.173)$$

$$-EXCISE^{(E)} + \text{excise}^{(E)} p^{\text{market}^{(E)}} \left( D^{\text{GOV}^{(E)}} + INV^{(E)} + X^{(E,A)} + X^{(E,B)} + X^{(E,C)} + X^{(E,D)} + X^{(E,E)} + X^{(E,F)} + X^{(E,G)} + X^{(E,H)} + X^{(E,I)} + X^{(E,J)} + X^{(E,K)} + \text{scale}^{(01)} D^{(E,01)} + \right. \\ \left. \right) \quad (16.174)$$

$$-EXCISE^{(F)} + \text{excise}^{(F)} p^{\text{market}^{(F)}} \left( D^{\text{GOV}^{(F)}} + INV^{(F)} + X^{(F,A)} + X^{(F,B)} + X^{(F,C)} + X^{(F,D)} + X^{(F,E)} + X^{(F,F)} + X^{(F,G)} + X^{(F,H)} + X^{(F,I)} + X^{(F,J)} + X^{(F,K)} + \text{scale}^{(01)} D^{(F,01)} + \right. \\ \left. \right) \quad (16.175)$$

$$-EXCISE^{(G)} + \text{excise}^{(G)} p^{\text{market}^{(G)}} \left( D^{\text{GOV}^{(G)}} + INV^{(G)} + X^{(G,A)} + X^{(G,B)} + X^{(G,C)} + X^{(G,D)} + X^{(G,E)} + X^{(G,F)} + X^{(G,G)} + X^{(G,H)} + X^{(G,I)} + X^{(G,J)} + X^{(G,K)} + \text{scale}^{(01)} D^{(G,01)} + \right. \\ \left. \right) \quad (16.176)$$

$$-EXCISE^{(H)} + \text{excise}^{(H)} p^{\text{market}^{(H)}} \left( D^{\text{GOV}^{(H)}} + INV^{(H)} + X^{(H,A)} + X^{(H,B)} + X^{(H,C)} + X^{(H,D)} + X^{(H,E)} + X^{(H,F)} + X^{(H,G)} + X^{(H,H)} + X^{(H,I)} + X^{(H,J)} + X^{(H,K)} + \text{scale}^{(01)} D^{(H,01)} + \right. \\ \left. \right) \quad (16.177)$$

$$-EXCISE^{(I)} + \text{excise}^{(I)} p^{\text{market}^{(I)}} \left( D^{\text{GOV}^{(I)}} + INV^{(I)} + X^{(I,A)} + X^{(I,B)} + X^{(I,C)} + X^{(I,D)} + X^{(I,E)} + X^{(I,F)} + X^{(I,G)} + X^{(I,H)} + X^{(I,I)} + X^{(I,J)} + X^{(I,K)} + \text{scale}^{(01)} D^{(I,01)} + \text{scale}^{(02)} D^{(I,02)} + \right. \\ \left. \right) \quad (16.178)$$

$$-EXCISE^{(J)} + \text{excise}^{(J)} p^{\text{market}^{(J)}} \left( D^{\text{GOV}^{(J)}} + INV^{(J)} + X^{(J,A)} + X^{(J,B)} + X^{(J,C)} + X^{(J,D)} + X^{(J,E)} + X^{(J,F)} + X^{(J,G)} + X^{(J,H)} + X^{(J,I)} + X^{(J,J)} + X^{(J,K)} + \text{scale}^{(01)} D^{(J,01)} + \text{scale}^{(02)} D^{(J,02)} + \right. \\ \left. \right) \quad (16.179)$$

$$-EXCISE^{(K)} + \text{excise}^{(K)} p^{\text{market}^{(K)}} \left( D^{\text{GOV}^{(K)}} + INV^{(K)} + X^{(K,A)} + X^{(K,B)} + X^{(K,C)} + X^{(K,D)} + X^{(K,E)} + X^{(K,F)} + X^{(K,G)} + X^{(K,H)} + X^{(K,I)} + X^{(K,J)} + X^{(K,K)} + \text{scale}^{(01)} D^{(K,01)} + \right. \\ \left. \right) \quad (16.180)$$

$$-EXPORT^{\text{ROW}^{(\text{eu})}} + p^{\text{for}^{(\text{eu})}} \left( EXP^{(\text{eu},A)} + EXP^{(\text{eu},B)} + EXP^{(\text{eu},C)} + EXP^{(\text{eu},D)} + EXP^{(\text{eu},E)} + EXP^{(\text{eu},F)} + EXP^{(\text{eu},G)} + EXP^{(\text{eu},H)} + EXP^{(\text{eu},I)} + EXP^{(\text{eu},J)} + EXP^{(\text{eu},K)} \right) = 0 \\ (16.181)$$

$$-EXPORT^{\text{ROW}^{(\text{neu})}} + p^{\text{for}^{(\text{neu})}} \left( EXP^{(\text{neu},A)} + EXP^{(\text{neu},B)} + EXP^{(\text{neu},C)} + EXP^{(\text{neu},D)} + EXP^{(\text{neu},E)} + EXP^{(\text{neu},F)} + EXP^{(\text{neu},G)} + EXP^{(\text{neu},H)} + EXP^{(\text{neu},I)} + EXP^{(\text{neu},J)} + EXP^{(\text{neu},K)} \right) = 0 \\ (16.182)$$

$$-IMPORT^{(A)} + \theta^{\text{imp}^{(A)}} \left( \alpha^{\text{imp}^{(\text{eu},A)}} \left( \text{am}^{\text{imp}^{(\text{eu})}} IMP^{(\text{eu},A)} \right)^{\sigma^{\text{imp}^{(A)}} - 1} \left( -1 + \sigma^{\text{imp}^{(A)}} \right) + \alpha^{\text{imp}^{(\text{neu},A)}} \left( \text{am}^{\text{imp}^{(\text{neu})}} IMP^{(\text{neu},A)} \right)^{\sigma^{\text{imp}^{(A)}} - 1} \left( -1 + \sigma^{\text{imp}^{(A)}} \right) \right)^{\sigma^{\text{imp}^{(A)}}} \left( -1 + \sigma^{\text{imp}^{(A)}} \right)^{-1} = 0 \\ (16.183)$$

$$-IMPORT^{(B)} + \theta^{\text{imp}^{(B)}} \left( \alpha^{\text{imp}^{(\text{eu},B)}} \left( \text{am}^{\text{imp}^{(\text{eu})}} IMP^{(\text{eu},B)} \right)^{\sigma^{\text{imp}^{(B)}} - 1} \left( -1 + \sigma^{\text{imp}^{(B)}} \right) + \alpha^{\text{imp}^{(\text{neu},B)}} \left( \text{am}^{\text{imp}^{(\text{neu})}} IMP^{(\text{neu},B)} \right)^{\sigma^{\text{imp}^{(B)}} - 1} \left( -1 + \sigma^{\text{imp}^{(B)}} \right) \right)^{\sigma^{\text{imp}^{(B)}}} \left( -1 + \sigma^{\text{imp}^{(B)}} \right)^{-1} = 0 \\ (16.184)$$

$$-IMPORT^{(C)} + \theta^{\text{imp}^{(C)}} \left( \alpha^{\text{imp}^{(\text{eu},C)}} \left( \text{am}^{\text{imp}^{(\text{eu})}} IMP^{(\text{eu},C)} \right)^{\sigma^{\text{imp}^{(C)}} - 1} \left( -1 + \sigma^{\text{imp}^{(C)}} \right) + \alpha^{\text{imp}^{(\text{neu},C)}} \left( \text{am}^{\text{imp}^{(\text{neu})}} IMP^{(\text{neu},C)} \right)^{\sigma^{\text{imp}^{(C)}} - 1} \left( -1 + \sigma^{\text{imp}^{(C)}} \right) \right)^{\sigma^{\text{imp}^{(C)}}} \left( -1 + \sigma^{\text{imp}^{(C)}} \right)^{-1} = 0 \\ (16.185)$$

$$-IMPORT^{(D)} + \theta^{imp^{(D)}} \left( \alpha^{imp^{(eu,D)}} \left( am^{imp^{(eu)}} IMP^{(eu,D)} \right)^{\sigma^{imp^{(D)}-1} (-1 + \sigma^{imp^{(D)}})} + \alpha^{imp^{(neu,D)}} \left( am^{imp^{(neu)}} IMP^{(neu,D)} \right)^{\sigma^{imp^{(D)}-1} (-1 + \sigma^{imp^{(D)}})} \right)^{\sigma^{imp^{(D)}} (-1 + \sigma^{imp^{(D)}})^{-1}} = 0 \quad (16.186)$$

$$-IMPORT^{(E)} + \theta^{imp^{(E)}} \left( \alpha^{imp^{(eu,E)}} \left( am^{imp^{(eu)}} IMP^{(eu,E)} \right)^{\sigma^{imp^{(E)}-1} (-1 + \sigma^{imp^{(E)}})} + \alpha^{imp^{(neu,E)}} \left( am^{imp^{(neu)}} IMP^{(neu,E)} \right)^{\sigma^{imp^{(E)}-1} (-1 + \sigma^{imp^{(E)}})} \right)^{\sigma^{imp^{(E)}} (-1 + \sigma^{imp^{(E)}})^{-1}} = 0 \quad (16.187)$$

$$-IMPORT^{(F)} + \theta^{imp^{(F)}} \left( \alpha^{imp^{(eu,F)}} \left( am^{imp^{(eu)}} IMP^{(eu,F)} \right)^{\sigma^{imp^{(F)}-1} (-1 + \sigma^{imp^{(F)}})} + \alpha^{imp^{(neu,F)}} \left( am^{imp^{(neu)}} IMP^{(neu,F)} \right)^{\sigma^{imp^{(F)}-1} (-1 + \sigma^{imp^{(F)}})} \right)^{\sigma^{imp^{(F)}} (-1 + \sigma^{imp^{(F)}})^{-1}} = 0 \quad (16.188)$$

$$-IMPORT^{(G)} + \theta^{imp^{(G)}} \left( \alpha^{imp^{(eu,G)}} \left( am^{imp^{(eu)}} IMP^{(eu,G)} \right)^{\sigma^{imp^{(G)}-1} (-1 + \sigma^{imp^{(G)}})} + \alpha^{imp^{(neu,G)}} \left( am^{imp^{(neu)}} IMP^{(neu,G)} \right)^{\sigma^{imp^{(G)}-1} (-1 + \sigma^{imp^{(G)}})} \right)^{\sigma^{imp^{(G)}} (-1 + \sigma^{imp^{(G)}})^{-1}} = 0 \quad (16.189)$$

$$-IMPORT^{(H)} + \theta^{imp^{(H)}} \left( \alpha^{imp^{(eu,H)}} \left( am^{imp^{(eu)}} IMP^{(eu,H)} \right)^{\sigma^{imp^{(H)}-1} (-1 + \sigma^{imp^{(H)}})} + \alpha^{imp^{(neu,H)}} \left( am^{imp^{(neu)}} IMP^{(neu,H)} \right)^{\sigma^{imp^{(H)}-1} (-1 + \sigma^{imp^{(H)}})} \right)^{\sigma^{imp^{(H)}} (-1 + \sigma^{imp^{(H)}})^{-1}} = 0 \quad (16.190)$$

$$-IMPORT^{(I)} + \theta^{imp^{(I)}} \left( \alpha^{imp^{(eu,I)}} \left( am^{imp^{(eu)}} IMP^{(eu,I)} \right)^{\sigma^{imp^{(I)}-1} (-1 + \sigma^{imp^{(I)}})} + \alpha^{imp^{(neu,I)}} \left( am^{imp^{(neu)}} IMP^{(neu,I)} \right)^{\sigma^{imp^{(I)}-1} (-1 + \sigma^{imp^{(I)}})} \right)^{\sigma^{imp^{(I)}} (-1 + \sigma^{imp^{(I)}})^{-1}} = 0 \quad (16.191)$$

$$-IMPORT^{(J)} + \theta^{imp^{(J)}} \left( \alpha^{imp^{(eu,J)}} \left( am^{imp^{(eu)}} IMP^{(eu,J)} \right)^{\sigma^{imp^{(J)}-1} (-1 + \sigma^{imp^{(J)}})} + \alpha^{imp^{(neu,J)}} \left( am^{imp^{(neu)}} IMP^{(neu,J)} \right)^{\sigma^{imp^{(J)}-1} (-1 + \sigma^{imp^{(J)}})} \right)^{\sigma^{imp^{(J)}} (-1 + \sigma^{imp^{(J)}})^{-1}} = 0 \quad (16.192)$$

$$-IMPORT^{(K)} + \theta^{imp^{(K)}} \left( \alpha^{imp^{(eu,K)}} \left( am^{imp^{(eu)}} IMP^{(eu,K)} \right)^{\sigma^{imp^{(K)}-1} (-1 + \sigma^{imp^{(K)}})} + \alpha^{imp^{(neu,K)}} \left( am^{imp^{(neu)}} IMP^{(neu,K)} \right)^{\sigma^{imp^{(K)}-1} (-1 + \sigma^{imp^{(K)}})} \right)^{\sigma^{imp^{(K)}} (-1 + \sigma^{imp^{(K)}})^{-1}} = 0 \quad (16.193)$$

$$-IMPORT^{ROW^{(eu)}} + p^{for^{(eu)}} ex^{rate^{(eu)}} \left( IMP^{(eu,A)} + IMP^{(eu,B)} + IMP^{(eu,C)} + IMP^{(eu,D)} + IMP^{(eu,E)} + IMP^{(eu,F)} + IMP^{(eu,G)} + IMP^{(eu,H)} + IMP^{(eu,I)} + IMP^{(eu,J)} + IMP^{(eu,K)} \right) = 0 \quad (16.194)$$

$$-IMPORT^{ROW^{(neu)}} + p^{for^{(neu)}} ex^{rate^{(neu)}} \left( IMP^{(neu,A)} + IMP^{(neu,B)} + IMP^{(neu,C)} + IMP^{(neu,D)} + IMP^{(neu,E)} + IMP^{(neu,F)} + IMP^{(neu,G)} + IMP^{(neu,H)} + IMP^{(neu,I)} + IMP^{(neu,J)} + IMP^{(neu,K)} \right) = 0 \quad (16.195)$$

$$-SAV^{(01)} + sw^{(01)} INC^{(01)} = 0 \quad (16.196)$$

$$-SAV^{(02)} + sw^{(02)} INC^{(02)} = 0 \quad (16.197)$$

$$-SAV^{(03)} + sw^{(03)} INC^{(03)} = 0 \quad (16.198)$$

$$-SAV^{(04)} + sw^{(04)} INC^{(04)} = 0 \quad (16.199)$$

$$-SAV^{(05)} + sw^{(05)} INC^{(05)} = 0 \quad (16.200)$$

$$-SAV^{(06)} + sw^{(06)} INC^{(06)} = 0 \quad (16.201)$$

$$-SAV^{(07)} + sw^{(07)} INC^{(07)} = 0 \quad (16.202)$$

$$-SAV^{(08)} + sw^{(08)} INC^{(08)} = 0 \quad (16.203)$$

$$-SAV^{(09)} + sw^{(09)} INC^{(09)} = 0 \quad (16.204)$$

$$-SAV^{(10)} + sw^{(10)} INC^{(10)} = 0 \quad (16.205)$$

$$-SUB^{s(A)} + sb^{rate(A)} \left( p^{int(A)} X^{(A,A)} + p^{int(B)} X^{(B,A)} + p^{int(C)} X^{(C,A)} + p^{int(D)} X^{(D,A)} + p^{int(E)} X^{(E,A)} + p^{int(F)} X^{(F,A)} + p^{int(G)} X^{(G,A)} + p^{int(H)} X^{(H,A)} + p^{int(I)} X^{(I,A)} + p^{int(J)} X^{(J,A)} \right) \quad (16.206)$$

$$-SUB^{s(B)} + sb^{rate(B)} \left( p^{int(A)} X^{(A,B)} + p^{int(B)} X^{(B,B)} + p^{int(C)} X^{(C,B)} + p^{int(D)} X^{(D,B)} + p^{int(E)} X^{(E,B)} + p^{int(F)} X^{(F,B)} + p^{int(G)} X^{(G,B)} + p^{int(H)} X^{(H,B)} + p^{int(I)} X^{(I,B)} + p^{int(J)} X^{(J,B)} \right) \quad (16.207)$$

$$-SUB^{s(C)} + sb^{rate(C)} \left( p^{int(A)} X^{(A,C)} + p^{int(B)} X^{(B,C)} + p^{int(C)} X^{(C,C)} + p^{int(D)} X^{(D,C)} + p^{int(E)} X^{(E,C)} + p^{int(F)} X^{(F,C)} + p^{int(G)} X^{(G,C)} + p^{int(H)} X^{(H,C)} + p^{int(I)} X^{(I,C)} + p^{int(J)} X^{(J,C)} \right) \quad (16.208)$$

$$-SUB^{s(D)} + sb^{rate(D)} \left( p^{int(A)} X^{(A,D)} + p^{int(B)} X^{(B,D)} + p^{int(C)} X^{(C,D)} + p^{int(D)} X^{(D,D)} + p^{int(E)} X^{(E,D)} + p^{int(F)} X^{(F,D)} + p^{int(G)} X^{(G,D)} + p^{int(H)} X^{(H,D)} + p^{int(I)} X^{(I,D)} + p^{int(J)} X^{(J,D)} \right) \quad (16.209)$$

$$-SUB^{s(E)} + sb^{rate(E)} \left( p^{int(A)} X^{(A,E)} + p^{int(B)} X^{(B,E)} + p^{int(C)} X^{(C,E)} + p^{int(D)} X^{(D,E)} + p^{int(E)} X^{(E,E)} + p^{int(F)} X^{(F,E)} + p^{int(G)} X^{(G,E)} + p^{int(H)} X^{(H,E)} + p^{int(I)} X^{(I,E)} + p^{int(J)} X^{(J,E)} \right) \quad (16.210)$$

$$-SUB^{s(F)} + sb^{rate(F)} \left( p^{int(A)} X^{(A,F)} + p^{int(B)} X^{(B,F)} + p^{int(C)} X^{(C,F)} + p^{int(D)} X^{(D,F)} + p^{int(E)} X^{(E,F)} + p^{int(F)} X^{(F,F)} + p^{int(G)} X^{(G,F)} + p^{int(H)} X^{(H,F)} + p^{int(I)} X^{(I,F)} + p^{int(J)} X^{(J,F)} \right) \quad (16.211)$$

$$-SUB^{s(G)} + sb^{rate(G)} \left( p^{int(A)} X^{(A,G)} + p^{int(B)} X^{(B,G)} + p^{int(C)} X^{(C,G)} + p^{int(D)} X^{(D,G)} + p^{int(E)} X^{(E,G)} + p^{int(F)} X^{(F,G)} + p^{int(G)} X^{(G,G)} + p^{int(H)} X^{(H,G)} + p^{int(I)} X^{(I,G)} + p^{int(J)} X^{(J,G)} \right) \quad (16.212)$$

$$-SUB^{s(H)} + sb^{rate(H)} \left( p^{int(A)} X^{(A,H)} + p^{int(B)} X^{(B,H)} + p^{int(C)} X^{(C,H)} + p^{int(D)} X^{(D,H)} + p^{int(E)} X^{(E,H)} + p^{int(F)} X^{(F,H)} + p^{int(G)} X^{(G,H)} + p^{int(H)} X^{(H,H)} + p^{int(I)} X^{(I,H)} + p^{int(J)} X^{(J,H)} \right) \quad (16.213)$$

$$-SUB^{s(I)} + sb^{rate(I)} \left( p^{int(A)} X^{(A,I)} + p^{int(B)} X^{(B,I)} + p^{int(C)} X^{(C,I)} + p^{int(D)} X^{(D,I)} + p^{int(E)} X^{(E,I)} + p^{int(F)} X^{(F,I)} + p^{int(G)} X^{(G,I)} + p^{int(H)} X^{(H,I)} + p^{int(I)} X^{(I,I)} + p^{int(J)} X^{(J,I)} + p^{int(K)} X^{(K,I)} \right) \quad (16.214)$$

$$-SUB^{s(J)} + sb^{rate(J)} \left( p^{int(A)} X^{(A,J)} + p^{int(B)} X^{(B,J)} + p^{int(C)} X^{(C,J)} + p^{int(D)} X^{(D,J)} + p^{int(E)} X^{(E,J)} + p^{int(F)} X^{(F,J)} + p^{int(G)} X^{(G,J)} + p^{int(H)} X^{(H,J)} + p^{int(I)} X^{(I,J)} + p^{int(J)} X^{(J,J)} + p^{int(K)} X^{(K,J)} \right) \quad (16.215)$$

$$-SUB^{s(K)} + sb^{rate(K)} \left( p^{int(A)} X^{(A,K)} + p^{int(B)} X^{(B,K)} + p^{int(C)} X^{(C,K)} + p^{int(D)} X^{(D,K)} + p^{int(E)} X^{(E,K)} + p^{int(F)} X^{(F,K)} + p^{int(G)} X^{(G,K)} + p^{int(H)} X^{(H,K)} + p^{int(I)} X^{(I,K)} + p^{int(J)} X^{(J,K)} \right) \quad (16.216)$$

$$-SUB^{p(A)} + sb^{p(A)} ARM^{(A)} = 0 \quad (16.217)$$

$$-SUB^{p(B)} + sb^{p(B)} ARM^{(B)} = 0 \quad (16.218)$$

$$-SUB^{p(C)} + sb^{p(C)} ARM^{(C)} = 0 \quad (16.219)$$

$$-SUB^{p(D)} + sb^{p(D)} ARM^{(D)} = 0 \quad (16.220)$$

$$-SUB^{p(E)} + sb^{p(E)} ARM^{(E)} = 0 \quad (16.221)$$

$$-SUB^{p(F)} + sb^{p(F)} ARM^{(F)} = 0 \quad (16.222)$$

$$-SUB^{p(G)} + sb^{p(G)} ARM^{(G)} = 0 \quad (16.223)$$

$$-SUB^{p(H)} + sb^{p(H)} ARM^{(H)} = 0 \quad (16.224)$$

$$-SUB^{p(I)} + sb^{p(I)} ARM^{(I)} = 0 \quad (16.225)$$

$$-SUB^{p(J)} + sb^{p(J)} ARM^{(J)} = 0 \quad (16.226)$$

$$-SUB^{p(K)} + sb^{p(K)} ARM^{(K)} = 0 \quad (16.227)$$

$$-TAX^{s(A)} + tax^{rate(A)} \left( p^{int(A)} X^{(A,A)} + p^{int(B)} X^{(B,A)} + p^{int(C)} X^{(C,A)} + p^{int(D)} X^{(D,A)} + p^{int(E)} X^{(E,A)} + p^{int(F)} X^{(F,A)} + p^{int(G)} X^{(G,A)} + p^{int(H)} X^{(H,A)} + p^{int(I)} X^{(I,A)} + p^{int(J)} X^{(J,A)} \right) \quad (16.228)$$

$$-TAX^{s(B)} + tax^{rate(B)} \left( p^{int(A)} X^{(A,B)} + p^{int(B)} X^{(B,B)} + p^{int(C)} X^{(C,B)} + p^{int(D)} X^{(D,B)} + p^{int(E)} X^{(E,B)} + p^{int(F)} X^{(F,B)} + p^{int(G)} X^{(G,B)} + p^{int(H)} X^{(H,B)} + p^{int(I)} X^{(I,B)} + p^{int(J)} X^{(J,B)} \right) \quad (16.229)$$

$$-TAX^{s(C)} + tax^{rate(C)} \left( p^{int(A)} X^{(A,C)} + p^{int(B)} X^{(B,C)} + p^{int(C)} X^{(C,C)} + p^{int(D)} X^{(D,C)} + p^{int(E)} X^{(E,C)} + p^{int(F)} X^{(F,C)} + p^{int(G)} X^{(G,C)} + p^{int(H)} X^{(H,C)} + p^{int(I)} X^{(I,C)} + p^{int(J)} X^{(J,C)} \right) \quad (16.230)$$

$$-TAX^{s(D)} + tax^{rate(D)} \left( p^{int(A)} X^{(A,D)} + p^{int(B)} X^{(B,D)} + p^{int(C)} X^{(C,D)} + p^{int(D)} X^{(D,D)} + p^{int(E)} X^{(E,D)} + p^{int(F)} X^{(F,D)} + p^{int(G)} X^{(G,D)} + p^{int(H)} X^{(H,D)} + p^{int(I)} X^{(I,D)} + p^{int(J)} X^{(J,D)} \right) \quad (16.231)$$

$$-TAX^{s(E)} + tax^{rate(E)} \left( p^{int(A)} X^{(A,E)} + p^{int(B)} X^{(B,E)} + p^{int(C)} X^{(C,E)} + p^{int(D)} X^{(D,E)} + p^{int(E)} X^{(E,E)} + p^{int(F)} X^{(F,E)} + p^{int(G)} X^{(G,E)} + p^{int(H)} X^{(H,E)} + p^{int(I)} X^{(I,E)} + p^{int(J)} X^{(J,E)} \right) \quad (16.232)$$

$$-TAX^{s(F)} + tax^{rate(F)} \left( p^{int(A)} X^{(A,F)} + p^{int(B)} X^{(B,F)} + p^{int(C)} X^{(C,F)} + p^{int(D)} X^{(D,F)} + p^{int(E)} X^{(E,F)} + p^{int(F)} X^{(F,F)} + p^{int(G)} X^{(G,F)} + p^{int(H)} X^{(H,F)} + p^{int(I)} X^{(I,F)} + p^{int(J)} X^{(J,F)} \right) \quad (16.233)$$

$$-TAX^{s(G)} + tax^{rate(G)} \left( p^{int(A)} X^{(A,G)} + p^{int(B)} X^{(B,G)} + p^{int(C)} X^{(C,G)} + p^{int(D)} X^{(D,G)} + p^{int(E)} X^{(E,G)} + p^{int(F)} X^{(F,G)} + p^{int(G)} X^{(G,G)} + p^{int(H)} X^{(H,G)} + p^{int(I)} X^{(I,G)} + p^{int(J)} X^{(J,G)} \right) \quad (16.234)$$

$$-TAX^{s(H)} + tax^{rate(H)} \left( p^{int(A)} X^{(A,H)} + p^{int(B)} X^{(B,H)} + p^{int(C)} X^{(C,H)} + p^{int(D)} X^{(D,H)} + p^{int(E)} X^{(E,H)} + p^{int(F)} X^{(F,H)} + p^{int(G)} X^{(G,H)} + p^{int(H)} X^{(H,H)} + p^{int(I)} X^{(I,H)} + p^{int(J)} X^{(J,H)} \right) \quad (16.235)$$

$$-TAX^{s(I)} + tax^{rate(I)} \left( p^{int(A)} X^{(A,I)} + p^{int(B)} X^{(B,I)} + p^{int(C)} X^{(C,I)} + p^{int(D)} X^{(D,I)} + p^{int(E)} X^{(E,I)} + p^{int(F)} X^{(F,I)} + p^{int(G)} X^{(G,I)} + p^{int(H)} X^{(H,I)} + p^{int(I)} X^{(I,I)} + p^{int(J)} X^{(J,I)} + p^{int(K)} X^{(K,I)} \right) \quad (16.236)$$

$$-TAX^{s\langle J \rangle} + \tau \omega^{rate\langle J \rangle} \left( p^{int\langle A \rangle} X^{A,J} + p^{int\langle B \rangle} X^{B,J} + p^{int\langle C \rangle} X^{C,J} + p^{int\langle D \rangle} X^{D,J} + p^{int\langle E \rangle} X^{E,J} + p^{int\langle F \rangle} X^{F,J} + p^{int\langle G \rangle} X^{G,J} + p^{int\langle H \rangle} X^{H,J} + p^{int\langle I \rangle} X^{I,J} + p^{int\langle J \rangle} X^{J,J} + p \right) \quad (16.237)$$

$$-TAX^{s\langle K \rangle} + \tau \omega^{rate\langle K \rangle} \left( p^{int\langle A \rangle} X^{A,K} + p^{int\langle B \rangle} X^{B,K} + p^{int\langle C \rangle} X^{C,K} + p^{int\langle D \rangle} X^{D,K} + p^{int\langle E \rangle} X^{E,K} + p^{int\langle F \rangle} X^{F,K} + p^{int\langle G \rangle} X^{G,K} + p^{int\langle H \rangle} X^{H,K} + p^{int\langle I \rangle} X^{I,K} + p^{int\langle J \rangle} X^{J,K} + p \right) \quad (16.238)$$

$$-THBANK^{(01)} + \alpha h^b{}^{(01)} INC^{(01)} = 0 \quad (16.239)$$

$$-THBANK^{(02)} + \alpha h^b{}^{(02)} INC^{(02)} = 0 \quad (16.240)$$

$$-THBANK^{(03)} + \alpha h^b{}^{(03)} INC^{(03)} = 0 \quad (16.241)$$

$$-THBANK^{(04)} + \alpha h^b{}^{(04)} INC^{(04)} = 0 \quad (16.242)$$

$$-THBANK^{(05)} + \alpha h^b{}^{(05)} INC^{(05)} = 0 \quad (16.243)$$

$$-THBANK^{(06)} + \alpha h^b{}^{(06)} INC^{(06)} = 0 \quad (16.244)$$

$$-THBANK^{(07)} + \alpha h^b{}^{(07)} INC^{(07)} = 0 \quad (16.245)$$

$$-THBANK^{(08)} + \alpha h^b{}^{(08)} INC^{(08)} = 0 \quad (16.246)$$

$$-THBANK^{(09)} + \alpha h^b{}^{(09)} INC^{(09)} = 0 \quad (16.247)$$

$$-THBANK^{(10)} + \alpha h^b{}^{(10)} INC^{(10)} = 0 \quad (16.248)$$

$$-TROWFIRM^{(eu)} + t^{rf(eu)} EXP^{ROW(eu)} = 0 \quad (16.249)$$

$$-TROWFIRM^{(neu)} + t^{rf(neu)} EXP^{ROW(neu)} = 0 \quad (16.250)$$

$$-TROWBANK^{(eu)} + t^{rb(eu)} EXP^{ROW(eu)} = 0 \quad (16.251)$$

$$-TROWBANK^{(neu)} + t^{rb(neu)} EXP^{ROW(neu)} = 0 \quad (16.252)$$

$$-TROWGOV^{(eu)} + t^{rg(eu)} EXP^{ROW(eu)} = 0 \quad (16.253)$$

$$-TROWGOV^{(neu)} + t^{rg(neu)} EXP^{ROW(neu)} = 0 \quad (16.254)$$

$$U^{(01)} - \left( \alpha^u{}^{(01)} DEM^{(01)} \omega^{u(01)-1} (-1 + \omega^{u(01)}) + \left( 1 - \alpha^u{}^{(01)} \right) LEIS^{(01)} \omega^{u(01)-1} (-1 + \omega^{u(01)}) \right) \omega^{u(01)} (-1 + \omega^{u(01)})^{-1} = 0 \quad (16.255)$$

$$U^{(02)} - \left( \alpha^u{}^{(02)} DEM^{(02)} \omega^{u(02)-1} (-1 + \omega^{u(02)}) + \left( 1 - \alpha^u{}^{(02)} \right) LEIS^{(02)} \omega^{u(02)-1} (-1 + \omega^{u(02)}) \right) \omega^{u(02)} (-1 + \omega^{u(02)})^{-1} = 0 \quad (16.256)$$

$$U^{(03)} - \left( \alpha^{u(03)} DEM^{(03)} \omega^{u(03)-1} (-1 + \omega^{u(03)}) + (1 - \alpha^{u(03)}) LEIS^{(03)} \omega^{u(03)-1} (-1 + \omega^{u(03)}) \right) \omega^{u(03)} (-1 + \omega^{u(03)})^{-1} = 0 \quad (16.257)$$

$$U^{(04)} - \left( \alpha^{u(04)} DEM^{(04)} \omega^{u(04)-1} (-1 + \omega^{u(04)}) + (1 - \alpha^{u(04)}) LEIS^{(04)} \omega^{u(04)-1} (-1 + \omega^{u(04)}) \right) \omega^{u(04)} (-1 + \omega^{u(04)})^{-1} = 0 \quad (16.258)$$

$$U^{(05)} - \left( \alpha^{u(05)} DEM^{(05)} \omega^{u(05)-1} (-1 + \omega^{u(05)}) + (1 - \alpha^{u(05)}) LEIS^{(05)} \omega^{u(05)-1} (-1 + \omega^{u(05)}) \right) \omega^{u(05)} (-1 + \omega^{u(05)})^{-1} = 0 \quad (16.259)$$

$$U^{(06)} - \left( \alpha^{u(06)} DEM^{(06)} \omega^{u(06)-1} (-1 + \omega^{u(06)}) + (1 - \alpha^{u(06)}) LEIS^{(06)} \omega^{u(06)-1} (-1 + \omega^{u(06)}) \right) \omega^{u(06)} (-1 + \omega^{u(06)})^{-1} = 0 \quad (16.260)$$

$$U^{(07)} - \left( \alpha^{u(07)} DEM^{(07)} \omega^{u(07)-1} (-1 + \omega^{u(07)}) + (1 - \alpha^{u(07)}) LEIS^{(07)} \omega^{u(07)-1} (-1 + \omega^{u(07)}) \right) \omega^{u(07)} (-1 + \omega^{u(07)})^{-1} = 0 \quad (16.261)$$

$$U^{(08)} - \left( \alpha^{u(08)} DEM^{(08)} \omega^{u(08)-1} (-1 + \omega^{u(08)}) + (1 - \alpha^{u(08)}) LEIS^{(08)} \omega^{u(08)-1} (-1 + \omega^{u(08)}) \right) \omega^{u(08)} (-1 + \omega^{u(08)})^{-1} = 0 \quad (16.262)$$

$$U^{(09)} - \left( \alpha^{u(09)} DEM^{(09)} \omega^{u(09)-1} (-1 + \omega^{u(09)}) + (1 - \alpha^{u(09)}) LEIS^{(09)} \omega^{u(09)-1} (-1 + \omega^{u(09)}) \right) \omega^{u(09)} (-1 + \omega^{u(09)})^{-1} = 0 \quad (16.263)$$

$$U^{(10)} - \left( \alpha^{u(10)} DEM^{(10)} \omega^{u(10)-1} (-1 + \omega^{u(10)}) + (1 - \alpha^{u(10)}) LEIS^{(10)} \omega^{u(10)-1} (-1 + \omega^{u(10)}) \right) \omega^{u(10)} (-1 + \omega^{u(10)})^{-1} = 0 \quad (16.264)$$

$$-VAT^{(A)} + ut^{(A)} p^{\text{market}^{(A)}} \left( 1 + \text{exise}^{(A)} \right) \left( D^{\text{GOV}^{(A)}} + INV^{(A)} + \text{scale}^{(01)} D^{(A,01)} + \text{scale}^{(02)} D^{(A,02)} + \text{scale}^{(03)} D^{(A,03)} + \text{scale}^{(04)} D^{(A,04)} + \text{scale}^{(05)} D^{(A,05)} + \text{scale}^{(06)} D^{(A,06)} + \text{scale}^{(07)} D^{(A,07)} \right) \quad (16.265)$$

$$-VAT^{(B)} + ut^{(B)} p^{\text{market}^{(B)}} \left( 1 + \text{exise}^{(B)} \right) \left( D^{\text{GOV}^{(B)}} + INV^{(B)} + \text{scale}^{(01)} D^{(B,01)} + \text{scale}^{(02)} D^{(B,02)} + \text{scale}^{(03)} D^{(B,03)} + \text{scale}^{(04)} D^{(B,04)} + \text{scale}^{(05)} D^{(B,05)} + \text{scale}^{(06)} D^{(B,06)} + \text{scale}^{(07)} D^{(B,07)} \right) \quad (16.266)$$

$$-VAT^{(C)} + ut^{(C)} p^{\text{market}^{(C)}} \left( 1 + \text{exise}^{(C)} \right) \left( D^{\text{GOV}^{(C)}} + INV^{(C)} + \text{scale}^{(01)} D^{(C,01)} + \text{scale}^{(02)} D^{(C,02)} + \text{scale}^{(03)} D^{(C,03)} + \text{scale}^{(04)} D^{(C,04)} + \text{scale}^{(05)} D^{(C,05)} + \text{scale}^{(06)} D^{(C,06)} + \text{scale}^{(07)} D^{(C,07)} \right) \quad (16.267)$$

$$-VAT^{(D)} + ut^{(D)} p^{\text{market}^{(D)}} \left( 1 + \text{exise}^{(D)} \right) \left( D^{\text{GOV}^{(D)}} + INV^{(D)} + \text{scale}^{(01)} D^{(D,01)} + \text{scale}^{(02)} D^{(D,02)} + \text{scale}^{(03)} D^{(D,03)} + \text{scale}^{(04)} D^{(D,04)} + \text{scale}^{(05)} D^{(D,05)} + \text{scale}^{(06)} D^{(D,06)} + \text{scale}^{(07)} D^{(D,07)} \right) \quad (16.268)$$

$$-VAT^{(E)} + ut^{(E)} p^{\text{market}^{(E)}} \left( 1 + \text{exise}^{(E)} \right) \left( D^{\text{GOV}^{(E)}} + INV^{(E)} + \text{scale}^{(01)} D^{(E,01)} + \text{scale}^{(02)} D^{(E,02)} + \text{scale}^{(03)} D^{(E,03)} + \text{scale}^{(04)} D^{(E,04)} + \text{scale}^{(05)} D^{(E,05)} + \text{scale}^{(06)} D^{(E,06)} + \text{scale}^{(07)} D^{(E,07)} \right) \quad (16.269)$$

$$-VAT^{(F)} + ut^{(F)} p^{\text{market}^{(F)}} \left( 1 + \text{exise}^{(F)} \right) \left( D^{\text{GOV}^{(F)}} + INV^{(F)} + \text{scale}^{(01)} D^{(F,01)} + \text{scale}^{(02)} D^{(F,02)} + \text{scale}^{(03)} D^{(F,03)} + \text{scale}^{(04)} D^{(F,04)} + \text{scale}^{(05)} D^{(F,05)} + \text{scale}^{(06)} D^{(F,06)} + \text{scale}^{(07)} D^{(F,07)} \right) \quad (16.270)$$

$$-VAT^{(G)} + wt^{(G)} p^{\text{market}^{(G)}} \left(1 + \text{exise}^{(G)}\right) \left(D^{\text{GOV}^{(G)}} + INV^{(G)} + \text{scale}^{(01)} D^{(G,01)} + \text{scale}^{(02)} D^{(G,02)} + \text{scale}^{(03)} D^{(G,03)} + \text{scale}^{(04)} D^{(G,04)} + \text{scale}^{(05)} D^{(G,05)} + \text{scale}^{(06)} D^{(G,06)} + \text{scale}^{(07)} D^{(G,07)}\right) \quad (16.271)$$

$$-VAT^{(H)} + wt^{(H)} p^{\text{market}^{(H)}} \left(1 + \text{exise}^{(H)}\right) \left(D^{\text{GOV}^{(H)}} + INV^{(H)} + \text{scale}^{(01)} D^{(H,01)} + \text{scale}^{(02)} D^{(H,02)} + \text{scale}^{(03)} D^{(H,03)} + \text{scale}^{(04)} D^{(H,04)} + \text{scale}^{(05)} D^{(H,05)} + \text{scale}^{(06)} D^{(H,06)} + \text{scale}^{(07)} D^{(H,07)}\right) \quad (16.272)$$

$$-VAT^{(I)} + wt^{(I)} p^{\text{market}^{(I)}} \left(1 + \text{exise}^{(I)}\right) \left(D^{\text{GOV}^{(I)}} + INV^{(I)} + \text{scale}^{(01)} D^{(I,01)} + \text{scale}^{(02)} D^{(I,02)} + \text{scale}^{(03)} D^{(I,03)} + \text{scale}^{(04)} D^{(I,04)} + \text{scale}^{(05)} D^{(I,05)} + \text{scale}^{(06)} D^{(I,06)} + \text{scale}^{(07)} D^{(I,07)}\right) \quad (16.273)$$

$$-VAT^{(J)} + wt^{(J)} p^{\text{market}^{(J)}} \left(1 + \text{exise}^{(J)}\right) \left(D^{\text{GOV}^{(J)}} + INV^{(J)} + \text{scale}^{(01)} D^{(J,01)} + \text{scale}^{(02)} D^{(J,02)} + \text{scale}^{(03)} D^{(J,03)} + \text{scale}^{(04)} D^{(J,04)} + \text{scale}^{(05)} D^{(J,05)} + \text{scale}^{(06)} D^{(J,06)} + \text{scale}^{(07)} D^{(J,07)}\right) \quad (16.274)$$

$$-VAT^{(K)} + wt^{(K)} p^{\text{market}^{(K)}} \left(1 + \text{exise}^{(K)}\right) \left(D^{\text{GOV}^{(K)}} + INV^{(K)} + \text{scale}^{(01)} D^{(K,01)} + \text{scale}^{(02)} D^{(K,02)} + \text{scale}^{(03)} D^{(K,03)} + \text{scale}^{(04)} D^{(K,04)} + \text{scale}^{(05)} D^{(K,05)} + \text{scale}^{(06)} D^{(K,06)} + \text{scale}^{(07)} D^{(K,07)}\right) \quad (16.275)$$

$$-X^{(A,A)} + \beta^{x(A,A)} Y^{\text{INT}^{(A)}} = 0 \quad (16.276)$$

$$-X^{(A,B)} + \beta^{x(A,B)} Y^{\text{INT}^{(B)}} = 0 \quad (16.277)$$

$$-X^{(A,C)} + \beta^{x(A,C)} Y^{\text{INT}^{(C)}} = 0 \quad (16.278)$$

$$-X^{(A,D)} + \beta^{x(A,D)} Y^{\text{INT}^{(D)}} = 0 \quad (16.279)$$

$$-X^{(A,E)} + \beta^{x(A,E)} Y^{\text{INT}^{(E)}} = 0 \quad (16.280)$$

$$-X^{(A,F)} + \beta^{x(A,F)} Y^{\text{INT}^{(F)}} = 0 \quad (16.281)$$

$$-X^{(A,G)} + \beta^{x(A,G)} Y^{\text{INT}^{(G)}} = 0 \quad (16.282)$$

$$-X^{(A,H)} + \beta^{x(A,H)} Y^{\text{INT}^{(H)}} = 0 \quad (16.283)$$

$$-X^{(A,I)} + \beta^{x(A,I)} Y^{\text{INT}^{(I)}} = 0 \quad (16.284)$$

$$-X^{(A,J)} + \beta^{x(A,J)} Y^{\text{INT}^{(J)}} = 0 \quad (16.285)$$

$$-X^{(A,K)} + \beta^{x(A,K)} Y^{\text{INT}^{(K)}} = 0 \quad (16.286)$$

$$-X^{(B,A)} + \beta^{x(B,A)} Y^{\text{INT}^{(A)}} = 0 \quad (16.287)$$

$$-X^{(B,B)} + \beta^{x(B,B)} Y^{\text{INT}^{(B)}} = 0 \quad (16.288)$$

$$-X^{(B,C)} + \beta^{x(B,C)} Y^{\text{INT}^{(C)}} = 0 \quad (16.289)$$

$$-X^{(B,D)} + \beta^{x(B,D)} Y^{\text{INT}^{(D)}} = 0 \quad (16.290)$$

$$-X^{(B,E)} + \beta^{x(B,E)} Y^{\text{INT}^{(E)}} = 0 \quad (16.291)$$



$$-X^{(B,F)} + \beta^{x(B,F)} Y^{\text{INT}(F)} = 0 \quad (16.292)$$

$$-X^{(B,G)} + \beta^{x(B,G)} Y^{\text{INT}(G)} = 0 \quad (16.293)$$

$$-X^{(B,H)} + \beta^{x(B,H)} Y^{\text{INT}(H)} = 0 \quad (16.294)$$

$$-X^{(B,I)} + \beta^{x(B,I)} Y^{\text{INT}(I)} = 0 \quad (16.295)$$

$$-X^{(B,J)} + \beta^{x(B,J)} Y^{\text{INT}(J)} = 0 \quad (16.296)$$

$$-X^{(B,K)} + \beta^{x(B,K)} Y^{\text{INT}(K)} = 0 \quad (16.297)$$

$$-X^{(C,A)} + \beta^{x(C,A)} Y^{\text{INT}(A)} = 0 \quad (16.298)$$

$$-X^{(C,B)} + \beta^{x(C,B)} Y^{\text{INT}(B)} = 0 \quad (16.299)$$

$$-X^{(C,C)} + \beta^{x(C,C)} Y^{\text{INT}(C)} = 0 \quad (16.300)$$

$$-X^{(C,D)} + \beta^{x(C,D)} Y^{\text{INT}(D)} = 0 \quad (16.301)$$

$$-X^{(C,E)} + \beta^{x(C,E)} Y^{\text{INT}(E)} = 0 \quad (16.302)$$

$$-X^{(C,F)} + \beta^{x(C,F)} Y^{\text{INT}(F)} = 0 \quad (16.303)$$

$$-X^{(C,G)} + \beta^{x(C,G)} Y^{\text{INT}(G)} = 0 \quad (16.304)$$

$$-X^{(C,H)} + \beta^{x(C,H)} Y^{\text{INT}(H)} = 0 \quad (16.305)$$

$$-X^{(C,I)} + \beta^{x(C,I)} Y^{\text{INT}(I)} = 0 \quad (16.306)$$

$$-X^{(C,J)} + \beta^{x(C,J)} Y^{\text{INT}(J)} = 0 \quad (16.307)$$

$$-X^{(C,K)} + \beta^{x(C,K)} Y^{\text{INT}(K)} = 0 \quad (16.308)$$

$$-X^{(D,A)} + \beta^{x(D,A)} Y^{\text{INT}(A)} = 0 \quad (16.309)$$

$$-X^{(D,B)} + \beta^{x(D,B)} Y^{\text{INT}(B)} = 0 \quad (16.310)$$

$$-X^{(D,C)} + \beta^{x(D,C)} Y^{\text{INT}(C)} = 0 \quad (16.311)$$

$$-X^{(D,D)} + \beta^{x(D,D)} Y^{\text{INT}(D)} = 0 \quad (16.312)$$

$$-X^{(D,E)} + \beta^{x(D,E)} Y^{\text{INT}(E)} = 0 \quad (16.313)$$

$$-X^{(D,F)} + \beta^{x(D,F)} Y^{\text{INT}(F)} = 0 \quad (16.314)$$

$$-X^{(D,G)} + \beta^{x(D,G)} Y^{\text{INT}(G)} = 0 \quad (16.315)$$

$$-X^{(D,H)} + \beta^{x(D,H)} Y^{\text{INT}(H)} = 0 \quad (16.316)$$

$$-X^{(D,I)} + \beta^{x(D,I)} Y^{\text{INT}(I)} = 0 \quad (16.317)$$

$$-X^{(D,J)} + \beta^{x(D,J)} Y^{\text{INT}(J)} = 0 \quad (16.318)$$

$$-X^{(D,K)} + \beta^{x(D,K)} Y^{\text{INT}(K)} = 0 \quad (16.319)$$

$$-X^{(E,A)} + \beta^{x(E,A)} Y^{\text{INT}(A)} = 0 \quad (16.320)$$

$$-X^{(E,B)} + \beta^{x(E,B)} Y^{\text{INT}(B)} = 0 \quad (16.321)$$

$$-X^{(E,C)} + \beta^{x(E,C)} Y^{\text{INT}(C)} = 0 \quad (16.322)$$

$$-X^{(E,D)} + \beta^{x(E,D)} Y^{\text{INT}(D)} = 0 \quad (16.323)$$

$$-X^{(E,E)} + \beta^{x(E,E)} Y^{\text{INT}(E)} = 0 \quad (16.324)$$

$$-X^{(E,F)} + \beta^{x(E,F)} Y^{\text{INT}(F)} = 0 \quad (16.325)$$

$$-X^{(E,G)} + \beta^{x(E,G)} Y^{\text{INT}(G)} = 0 \quad (16.326)$$

$$-X^{(E,H)} + \beta^{x(E,H)} Y^{\text{INT}(H)} = 0 \quad (16.327)$$

$$-X^{(E,I)} + \beta^{x(E,I)} Y^{\text{INT}(I)} = 0 \quad (16.328)$$

$$-X^{(E,J)} + \beta^{x(E,J)} Y^{\text{INT}(J)} = 0 \quad (16.329)$$

$$-X^{(E,K)} + \beta^{x(E,K)} Y^{\text{INT}(K)} = 0 \quad (16.330)$$

$$-X^{(F,A)} + \beta^{x(F,A)} Y^{\text{INT}(A)} = 0 \quad (16.331)$$

$$-X^{(F,B)} + \beta^{x(F,B)} Y^{\text{INT}(B)} = 0 \quad (16.332)$$

$$-X^{(F,C)} + \beta^{x(F,C)} Y^{\text{INT}(C)} = 0 \quad (16.333)$$

$$-X^{(F,D)} + \beta^{x(F,D)} Y^{\text{INT}(D)} = 0 \quad (16.334)$$

$$-X^{(F,E)} + \beta^{x(F,E)} Y^{\text{INT}(E)} = 0 \quad (16.335)$$

$$-X^{(F,F)} + \beta^{x(F,F)} Y^{\text{INT}(F)} = 0 \quad (16.336)$$

$$-X^{(F,G)} + \beta^{x(F,G)} Y^{\text{INT}(G)} = 0 \quad (16.337)$$

$$-X^{(F,H)} + \beta^{x(F,H)} Y^{\text{INT}(H)} = 0 \quad (16.338)$$

$$-X^{(F,I)} + \beta^{x(F,I)} Y^{\text{INT}(I)} = 0 \quad (16.339)$$

$$-X^{(F,J)} + \beta^{x(F,J)} Y^{\text{INT}(J)} = 0 \quad (16.340)$$

$$-X^{(F,K)} + \beta^{x(F,K)} Y^{\text{INT}(K)} = 0 \quad (16.341)$$

$$-X^{(G,A)} + \beta^{x(G,A)} Y^{\text{INT}(A)} = 0 \quad (16.342)$$

$$-X^{(G,B)} + \beta^{x(G,B)} Y^{\text{INT}(B)} = 0 \quad (16.343)$$

$$-X^{(G,C)} + \beta^{x(G,C)} Y^{\text{INT}(C)} = 0 \quad (16.344)$$

$$-X^{(G,D)} + \beta^{x(G,D)} Y^{\text{INT}(D)} = 0 \quad (16.345)$$

$$-X^{(G,E)} + \beta^{x(G,E)} Y^{\text{INT}(E)} = 0 \quad (16.346)$$

$$-X^{(G,F)} + \beta^{x(G,F)} Y^{\text{INT}(F)} = 0 \quad (16.347)$$

$$-X^{(G,G)} + \beta^{x(G,G)} Y^{\text{INT}(G)} = 0 \quad (16.348)$$

$$-X^{(G,H)} + \beta^{x(G,H)} Y^{\text{INT}(H)} = 0 \quad (16.349)$$

$$-X^{(G,I)} + \beta^{x(G,I)} Y^{\text{INT}(I)} = 0 \quad (16.350)$$

$$-X^{(G,J)} + \beta^{x(G,J)} Y^{\text{INT}(J)} = 0 \quad (16.351)$$

$$-X^{(G,K)} + \beta^{x(G,K)} Y^{\text{INT}(K)} = 0 \quad (16.352)$$

$$-X^{(H,A)} + \beta^{x(H,A)} Y^{\text{INT}(A)} = 0 \quad (16.353)$$

$$-X^{(H,B)} + \beta^{x(H,B)} Y^{\text{INT}(B)} = 0 \quad (16.354)$$

$$-X^{(H,C)} + \beta^{x(H,C)} Y^{\text{INT}(C)} = 0 \quad (16.355)$$

$$-X^{(H,D)} + \beta^{x(H,D)} Y^{\text{INT}(D)} = 0 \quad (16.356)$$

$$-X^{(H,E)} + \beta^{x(H,E)} Y^{\text{INT}(E)} = 0 \quad (16.357)$$

$$-X^{(H,F)} + \beta^{x(H,F)} Y^{\text{INT}(F)} = 0 \quad (16.358)$$

$$-X^{(H,G)} + \beta^{x(H,G)} Y^{\text{INT}(G)} = 0 \quad (16.359)$$

$$-X^{(H,H)} + \beta^{x(H,H)} Y^{\text{INT}(H)} = 0 \quad (16.360)$$

$$-X^{(H,I)} + \beta^{x(H,I)} Y^{INT(I)} = 0 \quad (16.361)$$

$$-X^{(H,J)} + \beta^{x(H,J)} Y^{INT(J)} = 0 \quad (16.362)$$

$$-X^{(H,K)} + \beta^{x(H,K)} Y^{INT(K)} = 0 \quad (16.363)$$

$$-X^{(I,A)} + \beta^{x(I,A)} Y^{INT(A)} = 0 \quad (16.364)$$

$$-X^{(I,B)} + \beta^{x(I,B)} Y^{INT(B)} = 0 \quad (16.365)$$

$$-X^{(I,C)} + \beta^{x(I,C)} Y^{INT(C)} = 0 \quad (16.366)$$

$$-X^{(I,D)} + \beta^{x(I,D)} Y^{INT(D)} = 0 \quad (16.367)$$

$$-X^{(I,E)} + \beta^{x(I,E)} Y^{INT(E)} = 0 \quad (16.368)$$

$$-X^{(I,F)} + \beta^{x(I,F)} Y^{INT(F)} = 0 \quad (16.369)$$

$$-X^{(I,G)} + \beta^{x(I,G)} Y^{INT(G)} = 0 \quad (16.370)$$

$$-X^{(I,H)} + \beta^{x(I,H)} Y^{INT(H)} = 0 \quad (16.371)$$

$$-X^{(I,I)} + \beta^{x(I,I)} Y^{INT(I)} = 0 \quad (16.372)$$

$$-X^{(I,J)} + \beta^{x(I,J)} Y^{INT(J)} = 0 \quad (16.373)$$

$$-X^{(I,K)} + \beta^{x(I,K)} Y^{INT(K)} = 0 \quad (16.374)$$

$$-X^{(J,A)} + \beta^{x(J,A)} Y^{INT(A)} = 0 \quad (16.375)$$

$$-X^{(J,B)} + \beta^{x(J,B)} Y^{INT(B)} = 0 \quad (16.376)$$

$$-X^{(J,C)} + \beta^{x(J,C)} Y^{INT(C)} = 0 \quad (16.377)$$

$$-X^{(J,D)} + \beta^{x(J,D)} Y^{INT(D)} = 0 \quad (16.378)$$

$$-X^{(J,E)} + \beta^{x(J,E)} Y^{INT(E)} = 0 \quad (16.379)$$

$$-X^{(J,F)} + \beta^{x(J,F)} Y^{INT(F)} = 0 \quad (16.380)$$

$$-X^{(J,G)} + \beta^{x(J,G)} Y^{INT(G)} = 0 \quad (16.381)$$

$$-X^{(J,H)} + \beta^{x(J,H)} Y^{INT(H)} = 0 \quad (16.382)$$

$$-X^{(J,I)} + \beta^{x(J,I)} Y^{INT(I)} = 0 \quad (16.383)$$

$$-X^{(J,J)} + \beta^{x(J,J)} Y^{INT^{(J)}} = 0 \quad (16.384)$$

$$-X^{(J,K)} + \beta^{x(J,K)} Y^{INT^{(K)}} = 0 \quad (16.385)$$

$$-X^{(K,A)} + \beta^{x(K,A)} Y^{INT^{(A)}} = 0 \quad (16.386)$$

$$-X^{(K,B)} + \beta^{x(K,B)} Y^{INT^{(B)}} = 0 \quad (16.387)$$

$$-X^{(K,C)} + \beta^{x(K,C)} Y^{INT^{(C)}} = 0 \quad (16.388)$$

$$-X^{(K,D)} + \beta^{x(K,D)} Y^{INT^{(D)}} = 0 \quad (16.389)$$

$$-X^{(K,E)} + \beta^{x(K,E)} Y^{INT^{(E)}} = 0 \quad (16.390)$$

$$-X^{(K,F)} + \beta^{x(K,F)} Y^{INT^{(F)}} = 0 \quad (16.391)$$

$$-X^{(K,G)} + \beta^{x(K,G)} Y^{INT^{(G)}} = 0 \quad (16.392)$$

$$-X^{(K,H)} + \beta^{x(K,H)} Y^{INT^{(H)}} = 0 \quad (16.393)$$

$$-X^{(K,I)} + \beta^{x(K,I)} Y^{INT^{(I)}} = 0 \quad (16.394)$$

$$-X^{(K,J)} + \beta^{x(K,J)} Y^{INT^{(J)}} = 0 \quad (16.395)$$

$$-X^{(K,K)} + \beta^{x(K,K)} Y^{INT^{(K)}} = 0 \quad (16.396)$$

$$-Y^{(A)} + Y^{VA^{(A)}} = 0 \quad (16.397)$$

$$-Y^{(A)} + \theta^{y(A)} \left( \alpha^{\text{Prod}^h(A)} Y^{\text{HOME}^{(A)}} \sigma^{\text{fProd}^{(A)-1}} \left( 1 + \sigma^{\text{fProd}^{(A)}} \right) + \alpha^{\text{Prod}^e(A)} \text{EXPORT}^{(A)} \sigma^{\text{fProd}^{(A)-1}} \left( 1 + \sigma^{\text{fProd}^{(A)}} \right) \right) \sigma^{\text{fProd}^{(A)}} \left( 1 + \sigma^{\text{fProd}^{(A)}} \right)^{-1} = 0 \quad (16.398)$$

$$-Y^{(B)} + Y^{VA^{(B)}} = 0 \quad (16.399)$$

$$-Y^{(B)} + \theta^{y(B)} \left( \alpha^{\text{Prod}^h(B)} Y^{\text{HOME}^{(B)}} \sigma^{\text{fProd}^{(B)-1}} \left( 1 + \sigma^{\text{fProd}^{(B)}} \right) + \alpha^{\text{Prod}^e(B)} \text{EXPORT}^{(B)} \sigma^{\text{fProd}^{(B)-1}} \left( 1 + \sigma^{\text{fProd}^{(B)}} \right) \right) \sigma^{\text{fProd}^{(B)}} \left( 1 + \sigma^{\text{fProd}^{(B)}} \right)^{-1} = 0 \quad (16.400)$$

$$-Y^{(C)} + Y^{VA^{(C)}} = 0 \quad (16.401)$$

$$-Y^{(C)} + \theta^{y(C)} \left( \alpha^{\text{Prod}^h(C)} Y^{\text{HOME}^{(C)}} \sigma^{\text{fProd}^{(C)-1}} \left( 1 + \sigma^{\text{fProd}^{(C)}} \right) + \alpha^{\text{Prod}^e(C)} \text{EXPORT}^{(C)} \sigma^{\text{fProd}^{(C)-1}} \left( 1 + \sigma^{\text{fProd}^{(C)}} \right) \right) \sigma^{\text{fProd}^{(C)}} \left( 1 + \sigma^{\text{fProd}^{(C)}} \right)^{-1} = 0 \quad (16.402)$$

$$-Y^{(D)} + Y^{VA(D)} = 0 \quad (16.403)$$

$$-Y^{(D)} + \theta^{y(D)} \left( \alpha^{\text{prod}^h(D)} Y^{\text{HOME}(D)} \sigma^{\text{fProd}(D)-1} \left( 1 + \sigma^{\text{fProd}(D)} \right) + \alpha^{\text{prod}^e(D)} \text{EXPORT}^{(D)} \sigma^{\text{fProd}(D)-1} \left( 1 + \sigma^{\text{fProd}(D)} \right) \right) \sigma^{\text{fProd}(D)} \left( 1 + \sigma^{\text{fProd}(D)} \right)^{-1} = 0 \quad (16.404)$$

$$-Y^{(E)} + Y^{VA(E)} = 0 \quad (16.405)$$

$$-Y^{(E)} + \theta^{y(E)} \left( \alpha^{\text{prod}^h(E)} Y^{\text{HOME}(E)} \sigma^{\text{fProd}(E)-1} \left( 1 + \sigma^{\text{fProd}(E)} \right) + \alpha^{\text{prod}^e(E)} \text{EXPORT}^{(E)} \sigma^{\text{fProd}(E)-1} \left( 1 + \sigma^{\text{fProd}(E)} \right) \right) \sigma^{\text{fProd}(E)} \left( 1 + \sigma^{\text{fProd}(E)} \right)^{-1} = 0 \quad (16.406)$$

$$-Y^{(F)} + Y^{VA(F)} = 0 \quad (16.407)$$

$$-Y^{(F)} + \theta^{y(F)} \left( \alpha^{\text{prod}^h(F)} Y^{\text{HOME}(F)} \sigma^{\text{fProd}(F)-1} \left( 1 + \sigma^{\text{fProd}(F)} \right) + \alpha^{\text{prod}^e(F)} \text{EXPORT}^{(F)} \sigma^{\text{fProd}(F)-1} \left( 1 + \sigma^{\text{fProd}(F)} \right) \right) \sigma^{\text{fProd}(F)} \left( 1 + \sigma^{\text{fProd}(F)} \right)^{-1} = 0 \quad (16.408)$$

$$-Y^{(G)} + Y^{VA(G)} = 0 \quad (16.409)$$

$$-Y^{(G)} + \theta^{y(G)} \left( \alpha^{\text{prod}^h(G)} Y^{\text{HOME}(G)} \sigma^{\text{fProd}(G)-1} \left( 1 + \sigma^{\text{fProd}(G)} \right) + \alpha^{\text{prod}^e(G)} \text{EXPORT}^{(G)} \sigma^{\text{fProd}(G)-1} \left( 1 + \sigma^{\text{fProd}(G)} \right) \right) \sigma^{\text{fProd}(G)} \left( 1 + \sigma^{\text{fProd}(G)} \right)^{-1} = 0 \quad (16.410)$$

$$-Y^{(H)} + Y^{VA(H)} = 0 \quad (16.411)$$

$$-Y^{(H)} + \theta^{y(H)} \left( \alpha^{\text{prod}^h(H)} Y^{\text{HOME}(H)} \sigma^{\text{fProd}(H)-1} \left( 1 + \sigma^{\text{fProd}(H)} \right) + \alpha^{\text{prod}^e(H)} \text{EXPORT}^{(H)} \sigma^{\text{fProd}(H)-1} \left( 1 + \sigma^{\text{fProd}(H)} \right) \right) \sigma^{\text{fProd}(H)} \left( 1 + \sigma^{\text{fProd}(H)} \right)^{-1} = 0 \quad (16.412)$$

$$-Y^{(I)} + Y^{VA(I)} = 0 \quad (16.413)$$

$$-Y^{(I)} + \theta^{y(I)} \left( \alpha^{\text{prod}^h(I)} Y^{\text{HOME}(I)} \sigma^{\text{fProd}(I)-1} \left( 1 + \sigma^{\text{fProd}(I)} \right) + \alpha^{\text{prod}^e(I)} \text{EXPORT}^{(I)} \sigma^{\text{fProd}(I)-1} \left( 1 + \sigma^{\text{fProd}(I)} \right) \right) \sigma^{\text{fProd}(I)} \left( 1 + \sigma^{\text{fProd}(I)} \right)^{-1} = 0 \quad (16.414)$$

$$-Y^{(J)} + Y^{VA(J)} = 0 \quad (16.415)$$

$$-Y^{(J)} + \theta^{y(J)} \left( \alpha^{\text{prod}^h(J)} Y^{\text{HOME}(J)} \sigma^{\text{fProd}(J)-1} \left( 1 + \sigma^{\text{fProd}(J)} \right) + \alpha^{\text{prod}^e(J)} \text{EXPORT}^{(J)} \sigma^{\text{fProd}(J)-1} \left( 1 + \sigma^{\text{fProd}(J)} \right) \right) \sigma^{\text{fProd}(J)} \left( 1 + \sigma^{\text{fProd}(J)} \right)^{-1} = 0 \quad (16.416)$$

$$-Y^{(K)} + Y^{VA(K)} = 0 \quad (16.417)$$

$$-Y^{(K)} + \theta^{y(K)} \left( \alpha^{\text{prod}^h(K)} Y^{\text{HOME}(K)} \sigma^{\text{fProd}(K)-1} \left( 1 + \sigma^{\text{fProd}(K)} \right) + \alpha^{\text{prod}^e(K)} \text{EXPORT}^{(K)} \sigma^{\text{fProd}(K)-1} \left( 1 + \sigma^{\text{fProd}(K)} \right) \right)^{\sigma^{\text{fProd}(K)} \left( 1 + \sigma^{\text{fProd}(K)} \right)^{-1}} = 0 \quad (16.418)$$

$$-Y^{VA(A)} + Y^{\text{INT}(A)} = 0 \quad (16.419)$$

$$-Y^{VA(A)} + \gamma^{yva(A)} K^{(A)\beta^k(A)} L^{(A)\beta^l(A)} = 0 \quad (16.420)$$

$$-Y^{VA(B)} + Y^{\text{INT}(B)} = 0 \quad (16.421)$$

$$-Y^{VA(B)} + \gamma^{yva(B)} K^{(B)\beta^k(B)} L^{(B)\beta^l(B)} = 0 \quad (16.422)$$

$$-Y^{VA(C)} + Y^{\text{INT}(C)} = 0 \quad (16.423)$$

$$-Y^{VA(C)} + \gamma^{yva(C)} K^{(C)\beta^k(C)} L^{(C)\beta^l(C)} = 0 \quad (16.424)$$

$$-Y^{VA(D)} + Y^{\text{INT}(D)} = 0 \quad (16.425)$$

$$-Y^{VA(D)} + \gamma^{yva(D)} K^{(D)\beta^k(D)} L^{(D)\beta^l(D)} = 0 \quad (16.426)$$

$$-Y^{VA(E)} + Y^{\text{INT}(E)} = 0 \quad (16.427)$$

$$-Y^{VA(E)} + \gamma^{yva(E)} K^{(E)\beta^k(E)} L^{(E)\beta^l(E)} = 0 \quad (16.428)$$

$$-Y^{VA(F)} + Y^{\text{INT}(F)} = 0 \quad (16.429)$$

$$-Y^{VA(F)} + \gamma^{yva(F)} K^{(F)\beta^k(F)} L^{(F)\beta^l(F)} = 0 \quad (16.430)$$

$$-Y^{VA(G)} + Y^{\text{INT}(G)} = 0 \quad (16.431)$$

$$-Y^{VA(G)} + \gamma^{yva(G)} K^{(G)\beta^k(G)} L^{(G)\beta^l(G)} = 0 \quad (16.432)$$

$$-Y^{VA(H)} + Y^{\text{INT}(H)} = 0 \quad (16.433)$$

$$-Y^{VA(H)} + \gamma^{yva(H)} K^{(H)\beta^k(H)} L^{(H)\beta^l(H)} = 0 \quad (16.434)$$

$$-Y^{VA(I)} + Y^{\text{INT}(I)} = 0 \quad (16.435)$$

$$-Y^{VA(I)} + \gamma^{yva(I)} K^{(I)\beta^k(I)} L^{(I)\beta^l(I)} = 0 \quad (16.436)$$

$$-Y^{VA(J)} + Y^{\text{INT}(J)} = 0 \quad (16.437)$$

$$-Y^{VA\langle J \rangle} + \gamma^{yva\langle J \rangle} K^{\langle J \rangle \beta^k \langle J \rangle} L^{\langle J \rangle \beta^l \langle J \rangle} = 0 \quad (16.438)$$

$$-Y^{VA\langle K \rangle} + Y^{INT\langle K \rangle} = 0 \quad (16.439)$$

$$-Y^{VA\langle K \rangle} + \gamma^{yva\langle K \rangle} K^{\langle K \rangle \beta^k \langle K \rangle} L^{\langle K \rangle \beta^l \langle K \rangle} = 0 \quad (16.440)$$

$$k^{\text{total data}} \text{ow}^{\langle 01 \rangle} - \text{sde}^{\langle 01 \rangle} K^{\langle 01 \rangle} = 0 \quad (16.441)$$

$$k^{\text{total data}} \text{ow}^{\langle 02 \rangle} - \text{sde}^{\langle 02 \rangle} K^{\langle 02 \rangle} = 0 \quad (16.442)$$

$$k^{\text{total data}} \text{ow}^{\langle 03 \rangle} - \text{sde}^{\langle 03 \rangle} K^{\langle 03 \rangle} = 0 \quad (16.443)$$

$$k^{\text{total data}} \text{ow}^{\langle 04 \rangle} - \text{sde}^{\langle 04 \rangle} K^{\langle 04 \rangle} = 0 \quad (16.444)$$

$$k^{\text{total data}} \text{ow}^{\langle 05 \rangle} - \text{sde}^{\langle 05 \rangle} K^{\langle 05 \rangle} = 0 \quad (16.445)$$

$$k^{\text{total data}} \text{ow}^{\langle 06 \rangle} - \text{sde}^{\langle 06 \rangle} K^{\langle 06 \rangle} = 0 \quad (16.446)$$

$$k^{\text{total data}} \text{ow}^{\langle 07 \rangle} - \text{sde}^{\langle 07 \rangle} K^{\langle 07 \rangle} = 0 \quad (16.447)$$

$$k^{\text{total data}} \text{ow}^{\langle 08 \rangle} - \text{sde}^{\langle 08 \rangle} K^{\langle 08 \rangle} = 0 \quad (16.448)$$

$$k^{\text{total data}} \text{ow}^{\langle 09 \rangle} - \text{sde}^{\langle 09 \rangle} K^{\langle 09 \rangle} = 0 \quad (16.449)$$

$$k^{\text{total data}} \text{ow}^{\langle 10 \rangle} - \text{sde}^{\langle 10 \rangle} K^{\langle 10 \rangle} = 0 \quad (16.450)$$

$$iw^{\langle A \rangle} INV - p^{\text{cons}\langle A \rangle} INV^{\langle A \rangle} = 0 \quad (16.451)$$

$$iw^{\langle B \rangle} INV - p^{\text{cons}\langle B \rangle} INV^{\langle B \rangle} = 0 \quad (16.452)$$

$$iw^{\langle C \rangle} INV - p^{\text{cons}\langle C \rangle} INV^{\langle C \rangle} = 0 \quad (16.453)$$

$$iw^{\langle D \rangle} INV - p^{\text{cons}\langle D \rangle} INV^{\langle D \rangle} = 0 \quad (16.454)$$

$$iw^{\langle E \rangle} INV - p^{\text{cons}\langle E \rangle} INV^{\langle E \rangle} = 0 \quad (16.455)$$

$$iw^{\langle F \rangle} INV - p^{\text{cons}\langle F \rangle} INV^{\langle F \rangle} = 0 \quad (16.456)$$

$$iw^{\langle G \rangle} INV - p^{\text{cons}\langle G \rangle} INV^{\langle G \rangle} = 0 \quad (16.457)$$

$$iw^{\langle H \rangle} INV - p^{\text{cons}\langle H \rangle} INV^{\langle H \rangle} = 0 \quad (16.458)$$

$$iw^{\langle I \rangle} INV - p^{\text{cons}\langle I \rangle} INV^{\langle I \rangle} = 0 \quad (16.459)$$

$$iw^{\langle J \rangle} INV - p^{\text{cons}\langle J \rangle} INV^{\langle J \rangle} = 0 \quad (16.460)$$

$$iw^{\langle K \rangle} INV - p^{\text{cons}\langle K \rangle} INV^{\langle K \rangle} = 0 \quad (16.461)$$

$$\text{owf}^{\langle 01 \rangle} INC^{\text{FIRM}} - \text{sde}^{\langle 01 \rangle} TFIRMH^{\langle 01 \rangle} = 0 \quad (16.462)$$



$$\omega f^{(02)} INC^{FIRM} - scale^{(02)} TFIRMH^{(02)} = 0 \quad (16.463)$$

$$\omega f^{(03)} INC^{FIRM} - scale^{(03)} TFIRMH^{(03)} = 0 \quad (16.464)$$

$$\omega f^{(04)} INC^{FIRM} - scale^{(04)} TFIRMH^{(04)} = 0 \quad (16.465)$$

$$\omega f^{(05)} INC^{FIRM} - scale^{(05)} TFIRMH^{(05)} = 0 \quad (16.466)$$

$$\omega f^{(06)} INC^{FIRM} - scale^{(06)} TFIRMH^{(06)} = 0 \quad (16.467)$$

$$\omega f^{(07)} INC^{FIRM} - scale^{(07)} TFIRMH^{(07)} = 0 \quad (16.468)$$

$$\omega f^{(08)} INC^{FIRM} - scale^{(08)} TFIRMH^{(08)} = 0 \quad (16.469)$$

$$\omega f^{(09)} INC^{FIRM} - scale^{(09)} TFIRMH^{(09)} = 0 \quad (16.470)$$

$$\omega f^{(10)} INC^{FIRM} - scale^{(10)} TFIRMH^{(10)} = 0 \quad (16.471)$$

$$\omega f^{(eu)} INC^{FIRM} - ex^{rate^{(eu)}} TFIRMROW^{(eu)} = 0 \quad (16.472)$$

$$\omega f^{(neu)} INC^{FIRM} - ex^{rate^{(neu)}} TFIRMROW^{(neu)} = 0 \quad (16.473)$$

$$\omega h^{r(01,eu)} INC^{(01)} - ex^{rate^{(eu)}} THROW^{(01,eu)} = 0 \quad (16.474)$$

$$\omega h^{r(01,neu)} INC^{(01)} - ex^{rate^{(neu)}} THROW^{(01,neu)} = 0 \quad (16.475)$$

$$\omega h^{r(02,eu)} INC^{(02)} - ex^{rate^{(eu)}} THROW^{(02,eu)} = 0 \quad (16.476)$$

$$\omega h^{r(02,neu)} INC^{(02)} - ex^{rate^{(neu)}} THROW^{(02,neu)} = 0 \quad (16.477)$$

$$\omega h^{r(03,eu)} INC^{(03)} - ex^{rate^{(eu)}} THROW^{(03,eu)} = 0 \quad (16.478)$$

$$\omega h^{r(03,neu)} INC^{(03)} - ex^{rate^{(neu)}} THROW^{(03,neu)} = 0 \quad (16.479)$$

$$\omega h^{r(04,eu)} INC^{(04)} - ex^{rate^{(eu)}} THROW^{(04,eu)} = 0 \quad (16.480)$$

$$\omega h^{r(04,neu)} INC^{(04)} - ex^{rate^{(neu)}} THROW^{(04,neu)} = 0 \quad (16.481)$$

$$\omega h^{r(05,eu)} INC^{(05)} - ex^{rate^{(eu)}} THROW^{(05,eu)} = 0 \quad (16.482)$$

$$\omega h^{r(05,neu)} INC^{(05)} - ex^{rate^{(neu)}} THROW^{(05,neu)} = 0 \quad (16.483)$$

$$\omega h^{r(06,eu)} INC^{(06)} - ex^{rate^{(eu)}} THROW^{(06,eu)} = 0 \quad (16.484)$$

$$\omega h^{r(06,neu)} INC^{(06)} - ex^{rate^{(neu)}} THROW^{(06,neu)} = 0 \quad (16.485)$$

$$\omega h^{r(07,eu)} INC^{(07)} - ex^{rate^{(eu)}} THROW^{(07,eu)} = 0 \quad (16.486)$$

$$\omega h^{r(07,neu)} INC^{(07)} - ex^{rate^{(neu)}} THROW^{(07,neu)} = 0 \quad (16.487)$$

$$\alpha h^{r(08,eu)} INC^{(08)} - ex^{rate^{(eu)}} THROW^{(08,eu)} = 0 \quad (16.488)$$

$$\alpha h^{r(08,neu)} INC^{(08)} - ex^{rate^{(neu)}} THROW^{(08,neu)} = 0 \quad (16.489)$$

$$\alpha h^{r(09,eu)} INC^{(09)} - ex^{rate^{(eu)}} THROW^{(09,eu)} = 0 \quad (16.490)$$

$$\alpha h^{r(09,neu)} INC^{(09)} - ex^{rate^{(neu)}} THROW^{(09,neu)} = 0 \quad (16.491)$$

$$\alpha h^{r(10,eu)} INC^{(10)} - ex^{rate^{(eu)}} THROW^{(10,eu)} = 0 \quad (16.492)$$

$$\alpha h^{r(10,neu)} INC^{(10)} - ex^{rate^{(neu)}} THROW^{(10,neu)} = 0 \quad (16.493)$$

$$\alpha b^{h(01)} INC^{BANK} - scale^{(01)} TBANKH^{(01)} = 0 \quad (16.494)$$

$$\alpha b^{h(02)} INC^{BANK} - scale^{(02)} TBANKH^{(02)} = 0 \quad (16.495)$$

$$\alpha b^{h(03)} INC^{BANK} - scale^{(03)} TBANKH^{(03)} = 0 \quad (16.496)$$

$$\alpha b^{h(04)} INC^{BANK} - scale^{(04)} TBANKH^{(04)} = 0 \quad (16.497)$$

$$\alpha b^{h(05)} INC^{BANK} - scale^{(05)} TBANKH^{(05)} = 0 \quad (16.498)$$

$$\alpha b^{h(06)} INC^{BANK} - scale^{(06)} TBANKH^{(06)} = 0 \quad (16.499)$$

$$\alpha b^{h(07)} INC^{BANK} - scale^{(07)} TBANKH^{(07)} = 0 \quad (16.500)$$

$$\alpha b^{h(08)} INC^{BANK} - scale^{(08)} TBANKH^{(08)} = 0 \quad (16.501)$$

$$\alpha b^{h(09)} INC^{BANK} - scale^{(09)} TBANKH^{(09)} = 0 \quad (16.502)$$

$$\alpha b^{h(10)} INC^{BANK} - scale^{(10)} TBANKH^{(10)} = 0 \quad (16.503)$$

$$\alpha b^{r^{(eu)}} INC^{BANK} - ex^{rate^{(eu)}} TBANKROW^{(eu)} = 0 \quad (16.504)$$

$$\alpha b^{r^{(neu)}} INC^{BANK} - ex^{rate^{(neu)}} TBANKROW^{(neu)} = 0 \quad (16.505)$$

$$-scale^{(01)} \lambda^{CONSUMER^1(01)} + (1 - \alpha^{u(01)}) LEIS^{(01)-1+\omega^{u(01)-1}(-1+\omega^{u(01)})} \left( \alpha^{u(01)} DEM^{(01)\omega^{u(01)-1}(-1+\omega^{u(01)})} + (1 - \alpha^{u(01)}) LEIS^{(01)\omega^{u(01)-1}(-1+\omega^{u(01)})} \right)^{-1+\omega^{u(01)}(-1+\omega^{u(01)})^{-1}} = 0 \quad (16.506)$$

$$-scale^{(02)} \lambda^{CONSUMER^1(02)} + (1 - \alpha^{u(02)}) LEIS^{(02)-1+\omega^{u(02)-1}(-1+\omega^{u(02)})} \left( \alpha^{u(02)} DEM^{(02)\omega^{u(02)-1}(-1+\omega^{u(02)})} + (1 - \alpha^{u(02)}) LEIS^{(02)\omega^{u(02)-1}(-1+\omega^{u(02)})} \right)^{-1+\omega^{u(02)}(-1+\omega^{u(02)})^{-1}} = 0 \quad (16.507)$$

$$-scale^{(03)} \lambda^{CONSUMER1(03)} + (1 - \alpha^{u(03)}) LEIS^{(03)-1+\omega^{u(03)-1}(-1+\omega^{u(03)})} \left( \alpha^{u(03)} DEM^{(03)\omega^{u(03)-1}(-1+\omega^{u(03)})} + (1 - \alpha^{u(03)}) LEIS^{(03)\omega^{u(03)-1}(-1+\omega^{u(03)})} \right)^{-1+\omega^{u(03)}(-1+\omega^{u(03)})^{-1}} = 0 \quad (16.508)$$

$$-scale^{(04)} \lambda^{CONSUMER1(04)} + (1 - \alpha^{u(04)}) LEIS^{(04)-1+\omega^{u(04)-1}(-1+\omega^{u(04)})} \left( \alpha^{u(04)} DEM^{(04)\omega^{u(04)-1}(-1+\omega^{u(04)})} + (1 - \alpha^{u(04)}) LEIS^{(04)\omega^{u(04)-1}(-1+\omega^{u(04)})} \right)^{-1+\omega^{u(04)}(-1+\omega^{u(04)})^{-1}} = 0 \quad (16.509)$$

$$-scale^{(05)} \lambda^{CONSUMER1(05)} + (1 - \alpha^{u(05)}) LEIS^{(05)-1+\omega^{u(05)-1}(-1+\omega^{u(05)})} \left( \alpha^{u(05)} DEM^{(05)\omega^{u(05)-1}(-1+\omega^{u(05)})} + (1 - \alpha^{u(05)}) LEIS^{(05)\omega^{u(05)-1}(-1+\omega^{u(05)})} \right)^{-1+\omega^{u(05)}(-1+\omega^{u(05)})^{-1}} = 0 \quad (16.510)$$

$$-scale^{(06)} \lambda^{CONSUMER1(06)} + (1 - \alpha^{u(06)}) LEIS^{(06)-1+\omega^{u(06)-1}(-1+\omega^{u(06)})} \left( \alpha^{u(06)} DEM^{(06)\omega^{u(06)-1}(-1+\omega^{u(06)})} + (1 - \alpha^{u(06)}) LEIS^{(06)\omega^{u(06)-1}(-1+\omega^{u(06)})} \right)^{-1+\omega^{u(06)}(-1+\omega^{u(06)})^{-1}} = 0 \quad (16.511)$$

$$-scale^{(07)} \lambda^{CONSUMER1(07)} + (1 - \alpha^{u(07)}) LEIS^{(07)-1+\omega^{u(07)-1}(-1+\omega^{u(07)})} \left( \alpha^{u(07)} DEM^{(07)\omega^{u(07)-1}(-1+\omega^{u(07)})} + (1 - \alpha^{u(07)}) LEIS^{(07)\omega^{u(07)-1}(-1+\omega^{u(07)})} \right)^{-1+\omega^{u(07)}(-1+\omega^{u(07)})^{-1}} = 0 \quad (16.512)$$

$$-scale^{(08)} \lambda^{CONSUMER1(08)} + (1 - \alpha^{u(08)}) LEIS^{(08)-1+\omega^{u(08)-1}(-1+\omega^{u(08)})} \left( \alpha^{u(08)} DEM^{(08)\omega^{u(08)-1}(-1+\omega^{u(08)})} + (1 - \alpha^{u(08)}) LEIS^{(08)\omega^{u(08)-1}(-1+\omega^{u(08)})} \right)^{-1+\omega^{u(08)}(-1+\omega^{u(08)})^{-1}} = 0 \quad (16.513)$$

$$-scale^{(09)} \lambda^{CONSUMER1(09)} + (1 - \alpha^{u(09)}) LEIS^{(09)-1+\omega^{u(09)-1}(-1+\omega^{u(09)})} \left( \alpha^{u(09)} DEM^{(09)\omega^{u(09)-1}(-1+\omega^{u(09)})} + (1 - \alpha^{u(09)}) LEIS^{(09)\omega^{u(09)-1}(-1+\omega^{u(09)})} \right)^{-1+\omega^{u(09)}(-1+\omega^{u(09)})^{-1}} = 0 \quad (16.514)$$

$$-scale^{(10)} \lambda^{CONSUMER1(10)} + (1 - \alpha^{u(10)}) LEIS^{(10)-1+\omega^{u(10)-1}(-1+\omega^{u(10)})} \left( \alpha^{u(10)} DEM^{(10)\omega^{u(10)-1}(-1+\omega^{u(10)})} + (1 - \alpha^{u(10)}) LEIS^{(10)\omega^{u(10)-1}(-1+\omega^{u(10)})} \right)^{-1+\omega^{u(10)}(-1+\omega^{u(10)})^{-1}} = 0 \quad (16.515)$$

$$t^{rh(eu,01)} EXPROW^{(eu)} - scale^{(01)} TROWH^{(eu,01)} = 0 \quad (16.516)$$

$$t^{rh(eu,02)} EXPROW^{(eu)} - scale^{(02)} TROWH^{(eu,02)} = 0 \quad (16.517)$$

$$t^{rh(eu,03)} EXPROW^{(eu)} - scale^{(03)} TROWH^{(eu,03)} = 0 \quad (16.518)$$

$$t^{rh(eu,04)} EXPROW^{(eu)} - scale^{(04)} TROWH^{(eu,04)} = 0 \quad (16.519)$$

$$t^{rh(eu,05)} EXPROW^{(eu)} - scale^{(05)} TROWH^{(eu,05)} = 0 \quad (16.520)$$

$$t^{rh(eu,06)} EXPROW^{(eu)} - scale^{(06)} TROWH^{(eu,06)} = 0 \quad (16.521)$$

$$t^{rh(eu,07)} EXPROW^{(eu)} - scale^{(07)} TROWH^{(eu,07)} = 0 \quad (16.522)$$





































$$tgoch^{data(06)} + tgoch^{data^{extra}(06)} - scale^{(06)} TGOVH^{(06)} = 0 \quad (16.726)$$

$$tgoch^{data(07)} + tgoch^{data^{extra}(07)} - scale^{(07)} TGOVH^{(07)} = 0 \quad (16.727)$$

$$tgoch^{data(08)} + tgoch^{data^{extra}(08)} - scale^{(08)} TGOVH^{(08)} = 0 \quad (16.728)$$

$$tgoch^{data(09)} + tgoch^{data^{extra}(09)} - scale^{(09)} TGOVH^{(09)} = 0 \quad (16.729)$$

$$tgoch^{data(10)} + tgoch^{data^{extra}(10)} - scale^{(10)} TGOVH^{(10)} = 0 \quad (16.730)$$

$$BANKTAX - CIT + FIRMTAX = 0 \quad (16.731)$$

$$EXP^{GOV} - INC^{GOV} + SAV^{GOV} = 0 \quad (16.732)$$

$$INC^{FIRM} - SAV^{FIRM} - TRAN^{FIRM} = 0 \quad (16.733)$$

$$INC^{BANK} - SAV^{BANK} - TRAN^{BANK} = 0 \quad (16.734)$$

$$K^{TAX} + L^{TAX} - SOCTAX = 0 \quad (16.735)$$

$$-TROWGOV + TROWGOV^{(eu)} + TROWGOV^{(neu)} = 0 \quad (16.736)$$

$$\pi^{(A)} - p^{(A)} Y^{(A)} + \left(1 - sub^{rate(A)} + tax^{rate(A)}\right) \left(p^{int(A)} X^{(A,A)} + p^{int(B)} X^{(B,A)} + p^{int(C)} X^{(C,A)} + p^{int(D)} X^{(D,A)} + p^{int(E)} X^{(E,A)} + p^{int(F)} X^{(F,A)} + p^{int(G)} X^{(G,A)} + p^{int(H)} X^{(H,A)} + p^{int(I)} X^{(I,A)}\right) \quad (16.737)$$

$$\pi^{(B)} - p^{(B)} Y^{(B)} + \left(1 - sub^{rate(B)} + tax^{rate(B)}\right) \left(p^{int(A)} X^{(A,B)} + p^{int(B)} X^{(B,B)} + p^{int(C)} X^{(C,B)} + p^{int(D)} X^{(D,B)} + p^{int(E)} X^{(E,B)} + p^{int(F)} X^{(F,B)} + p^{int(G)} X^{(G,B)} + p^{int(H)} X^{(H,B)} + p^{int(I)} X^{(I,B)}\right) \quad (16.738)$$

$$\pi^{(C)} - p^{(C)} Y^{(C)} + \left(1 - sub^{rate(C)} + tax^{rate(C)}\right) \left(p^{int(A)} X^{(A,C)} + p^{int(B)} X^{(B,C)} + p^{int(C)} X^{(C,C)} + p^{int(D)} X^{(D,C)} + p^{int(E)} X^{(E,C)} + p^{int(F)} X^{(F,C)} + p^{int(G)} X^{(G,C)} + p^{int(H)} X^{(H,C)} + p^{int(I)} X^{(I,C)}\right) \quad (16.739)$$

$$\pi^{(D)} - p^{(D)} Y^{(D)} + \left(1 - sub^{rate(D)} + tax^{rate(D)}\right) \left(p^{int(A)} X^{(A,D)} + p^{int(B)} X^{(B,D)} + p^{int(C)} X^{(C,D)} + p^{int(D)} X^{(D,D)} + p^{int(E)} X^{(E,D)} + p^{int(F)} X^{(F,D)} + p^{int(G)} X^{(G,D)} + p^{int(H)} X^{(H,D)} + p^{int(I)} X^{(I,D)}\right) \quad (16.740)$$

$$\pi^{(E)} - p^{(E)} Y^{(E)} + \left(1 - sub^{rate(E)} + tax^{rate(E)}\right) \left(p^{int(A)} X^{(A,E)} + p^{int(B)} X^{(B,E)} + p^{int(C)} X^{(C,E)} + p^{int(D)} X^{(D,E)} + p^{int(E)} X^{(E,E)} + p^{int(F)} X^{(F,E)} + p^{int(G)} X^{(G,E)} + p^{int(H)} X^{(H,E)} + p^{int(I)} X^{(I,E)}\right) \quad (16.741)$$

$$\pi^{(F)} - p^{(F)} Y^{(F)} + \left(1 - sub^{rate(F)} + tax^{rate(F)}\right) \left(p^{int(A)} X^{(A,F)} + p^{int(B)} X^{(B,F)} + p^{int(C)} X^{(C,F)} + p^{int(D)} X^{(D,F)} + p^{int(E)} X^{(E,F)} + p^{int(F)} X^{(F,F)} + p^{int(G)} X^{(G,F)} + p^{int(H)} X^{(H,F)} + p^{int(I)} X^{(I,F)}\right) \quad (16.742)$$

$$\pi^{(G)} - p^{(G)} Y^{(G)} + \left(1 - sub^{rate(G)} + tax^{rate(G)}\right) \left(p^{int(A)} X^{(A,G)} + p^{int(B)} X^{(B,G)} + p^{int(C)} X^{(C,G)} + p^{int(D)} X^{(D,G)} + p^{int(E)} X^{(E,G)} + p^{int(F)} X^{(F,G)} + p^{int(G)} X^{(G,G)} + p^{int(H)} X^{(H,G)} + p^{int(I)} X^{(I,G)}\right) \quad (16.743)$$

$$\pi^{(H)} - p^{(H)} Y^{(H)} + \left(1 - sub^{rate(H)} + tax^{rate(H)}\right) \left(p^{int(A)} X^{(A,H)} + p^{int(B)} X^{(B,H)} + p^{int(C)} X^{(C,H)} + p^{int(D)} X^{(D,H)} + p^{int(E)} X^{(E,H)} + p^{int(F)} X^{(F,H)} + p^{int(G)} X^{(G,H)} + p^{int(H)} X^{(H,H)} + p^{int(I)} X^{(I,H)}\right) \quad (16.744)$$

$$\pi^{(I)} - p^{(I)} Y^{(I)} + \left(1 - sub^{rate(I)} + tax^{rate(I)}\right) \left(p^{int(A)} X^{(A,I)} + p^{int(B)} X^{(B,I)} + p^{int(C)} X^{(C,I)} + p^{int(D)} X^{(D,I)} + p^{int(E)} X^{(E,I)} + p^{int(F)} X^{(F,I)} + p^{int(G)} X^{(G,I)} + p^{int(H)} X^{(H,I)} + p^{int(I)} X^{(I,I)}\right) \quad (16.745)$$

$$\pi^{(J)} - p^{(J)} Y^{(J)} + \left(1 - \text{sub}^{\text{rate}(J)} + \text{tax}^{\text{rate}(J)}\right) \left(p^{\text{int}(A)} X^{(A,J)} + p^{\text{int}(B)} X^{(B,J)} + p^{\text{int}(C)} X^{(C,J)} + p^{\text{int}(D)} X^{(D,J)} + p^{\text{int}(E)} X^{(E,J)} + p^{\text{int}(F)} X^{(F,J)} + p^{\text{int}(G)} X^{(G,J)} + p^{\text{int}(H)} X^{(H,J)} + p^{\text{int}(I)} X^{(I,J)}\right) \quad (16.746)$$

$$\pi^{(K)} - p^{(K)} Y^{(K)} + \left(1 - \text{sub}^{\text{rate}(K)} + \text{tax}^{\text{rate}(K)}\right) \left(p^{\text{int}(A)} X^{(A,K)} + p^{\text{int}(B)} X^{(B,K)} + p^{\text{int}(C)} X^{(C,K)} + p^{\text{int}(D)} X^{(D,K)} + p^{\text{int}(E)} X^{(E,K)} + p^{\text{int}(F)} X^{(F,K)} + p^{\text{int}(G)} X^{(G,K)} + p^{\text{int}(H)} X^{(H,K)} + p^{\text{int}(I)} X^{(I,K)}\right) \quad (16.747)$$

$$BTINC^{(01)} - INC^{(01)} - \text{pit}^{\text{tax}(01)} PII^{\text{base}(01)} = 0 \quad (16.748)$$

$$BTINC^{(02)} - INC^{(02)} - \text{pit}^{\text{tax}(02)} PII^{\text{base}(02)} = 0 \quad (16.749)$$

$$BTINC^{(03)} - INC^{(03)} - \text{pit}^{\text{tax}(03)} PII^{\text{base}(03)} = 0 \quad (16.750)$$

$$BTINC^{(04)} - INC^{(04)} - \text{pit}^{\text{tax}(04)} PII^{\text{base}(04)} = 0 \quad (16.751)$$

$$BTINC^{(05)} - INC^{(05)} - \text{pit}^{\text{tax}(05)} PII^{\text{base}(05)} = 0 \quad (16.752)$$

$$BTINC^{(06)} - INC^{(06)} - \text{pit}^{\text{tax}(06)} PII^{\text{base}(06)} = 0 \quad (16.753)$$

$$BTINC^{(07)} - INC^{(07)} - \text{pit}^{\text{tax}(07)} PII^{\text{base}(07)} = 0 \quad (16.754)$$

$$BTINC^{(08)} - INC^{(08)} - \text{pit}^{\text{tax}(08)} PII^{\text{base}(08)} = 0 \quad (16.755)$$

$$BTINC^{(09)} - INC^{(09)} - \text{pit}^{\text{tax}(09)} PII^{\text{base}(09)} = 0 \quad (16.756)$$

$$BTINC^{(10)} - INC^{(10)} - \text{pit}^{\text{tax}(10)} PII^{\text{base}(10)} = 0 \quad (16.757)$$

$$EXCISE^{(A)} - TAX^{\text{p}(A)} + VAT^{(A)} = 0 \quad (16.758)$$

$$EXCISE^{(B)} - TAX^{\text{p}(B)} + VAT^{(B)} = 0 \quad (16.759)$$

$$EXCISE^{(C)} - TAX^{\text{p}(C)} + VAT^{(C)} = 0 \quad (16.760)$$

$$EXCISE^{(D)} - TAX^{\text{p}(D)} + VAT^{(D)} = 0 \quad (16.761)$$

$$EXCISE^{(E)} - TAX^{\text{p}(E)} + VAT^{(E)} = 0 \quad (16.762)$$

$$EXCISE^{(F)} - TAX^{\text{p}(F)} + VAT^{(F)} = 0 \quad (16.763)$$

$$EXCISE^{(G)} - TAX^{\text{p}(G)} + VAT^{(G)} = 0 \quad (16.764)$$

$$EXCISE^{(H)} - TAX^{\text{p}(H)} + VAT^{(H)} = 0 \quad (16.765)$$

$$EXCISE^{(I)} - TAX^{\text{p}(I)} + VAT^{(I)} = 0 \quad (16.766)$$

$$EXCISE^{(J)} - TAX^{\text{p}(J)} + VAT^{(J)} = 0 \quad (16.767)$$

$$EXCISE^{(K)} - TAX^{\text{p}(K)} + VAT^{(K)} = 0 \quad (16.768)$$

$$-EXP^{ROW\langle eu \rangle} + EXPORT^{ROW\langle eu \rangle} + TRAN^{\langle eu \rangle} = 0 \quad (16.769)$$

$$EXP^{ROW\langle eu \rangle} - INC^{ROW\langle eu \rangle} + SAV^{\langle eu \rangle} = 0 \quad (16.770)$$

$$-EXP^{ROW\langle neu \rangle} + EXPORT^{ROW\langle neu \rangle} + TRAN^{\langle neu \rangle} = 0 \quad (16.771)$$

$$EXP^{ROW\langle neu \rangle} - INC^{ROW\langle neu \rangle} + SAV^{\langle neu \rangle} = 0 \quad (16.772)$$

$$IMPORT^{ROW\langle eu \rangle} - INC^{ROW\langle eu \rangle} + ex^{rate\langle eu \rangle} \left( TBANKROW^{\langle eu \rangle} + TFIRMROW^{\langle eu \rangle} + TGOVROW^{\langle eu \rangle} + scale^{(01)} THROW^{\langle 01, eu \rangle} + scale^{(02)} THROW^{\langle 02, eu \rangle} + scale^{(03)} THROW^{\langle 03, eu \rangle} + scale^{(04)} THROW^{\langle 04, eu \rangle} \right) = 0 \quad (16.773)$$

$$IMPORT^{ROW\langle neu \rangle} - INC^{ROW\langle neu \rangle} + ex^{rate\langle neu \rangle} \left( TBANKROW^{\langle neu \rangle} + TFIRMROW^{\langle neu \rangle} + TGOVROW^{\langle neu \rangle} + scale^{(01)} THROW^{\langle 01, neu \rangle} + scale^{(02)} THROW^{\langle 02, neu \rangle} + scale^{(03)} THROW^{\langle 03, neu \rangle} + scale^{(04)} THROW^{\langle 04, neu \rangle} \right) = 0 \quad (16.774)$$

$$L^{\langle 01 \rangle} - LL^{\langle 01 \rangle} + UNEMP^{\langle 01 \rangle} = 0 \quad (16.775)$$

$$L^{\langle 02 \rangle} - LL^{\langle 02 \rangle} + UNEMP^{\langle 02 \rangle} = 0 \quad (16.776)$$

$$L^{\langle 03 \rangle} - LL^{\langle 03 \rangle} + UNEMP^{\langle 03 \rangle} = 0 \quad (16.777)$$

$$L^{\langle 04 \rangle} - LL^{\langle 04 \rangle} + UNEMP^{\langle 04 \rangle} = 0 \quad (16.778)$$

$$L^{\langle 05 \rangle} - LL^{\langle 05 \rangle} + UNEMP^{\langle 05 \rangle} = 0 \quad (16.779)$$

$$L^{\langle 06 \rangle} - LL^{\langle 06 \rangle} + UNEMP^{\langle 06 \rangle} = 0 \quad (16.780)$$

$$L^{\langle 07 \rangle} - LL^{\langle 07 \rangle} + UNEMP^{\langle 07 \rangle} = 0 \quad (16.781)$$

$$L^{\langle 08 \rangle} - LL^{\langle 08 \rangle} + UNEMP^{\langle 08 \rangle} = 0 \quad (16.782)$$

$$L^{\langle 09 \rangle} - LL^{\langle 09 \rangle} + UNEMP^{\langle 09 \rangle} = 0 \quad (16.783)$$

$$L^{\langle 10 \rangle} - LL^{\langle 10 \rangle} + UNEMP^{\langle 10 \rangle} = 0 \quad (16.784)$$

$$-scale^{(01)} \lambda^{CONSUMER^1\langle 01 \rangle} + p^1 \left( -\lambda^{CONSUMER^{12}\langle 01 \rangle} + awh^{b(01)} \lambda^{CONSUMER^{12}\langle 01 \rangle} + awh^{r(01, eu)} \lambda^{CONSUMER^{11}\langle 01, eu \rangle} + awh^{r(01, neu)} \lambda^{CONSUMER^{11}\langle 01, neu \rangle} - \overline{p}^{tax(01)} \left( -\lambda^{CONSUMER^{12}\langle 01 \rangle} \right) \right) = 0 \quad (16.785)$$

$$-scale^{(02)} \lambda^{CONSUMER^1\langle 02 \rangle} + p^1 \left( -\lambda^{CONSUMER^{12}\langle 02 \rangle} + awh^{b(02)} \lambda^{CONSUMER^{12}\langle 02 \rangle} + awh^{r(02, eu)} \lambda^{CONSUMER^{11}\langle 02, eu \rangle} + awh^{r(02, neu)} \lambda^{CONSUMER^{11}\langle 02, neu \rangle} - \overline{p}^{tax(02)} \left( -\lambda^{CONSUMER^{12}\langle 02 \rangle} \right) \right) = 0 \quad (16.786)$$

$$-scale^{(03)} \lambda^{CONSUMER^1\langle 03 \rangle} + p^1 \left( -\lambda^{CONSUMER^{12}\langle 03 \rangle} + awh^{b(03)} \lambda^{CONSUMER^{12}\langle 03 \rangle} + awh^{r(03, eu)} \lambda^{CONSUMER^{11}\langle 03, eu \rangle} + awh^{r(03, neu)} \lambda^{CONSUMER^{11}\langle 03, neu \rangle} - \overline{p}^{tax(03)} \left( -\lambda^{CONSUMER^{12}\langle 03 \rangle} \right) \right) = 0 \quad (16.787)$$

$$-scale^{(04)} \lambda^{CONSUMER^1\langle 04 \rangle} + p^1 \left( -\lambda^{CONSUMER^{12}\langle 04 \rangle} + awh^{b(04)} \lambda^{CONSUMER^{12}\langle 04 \rangle} + awh^{r(04, eu)} \lambda^{CONSUMER^{11}\langle 04, eu \rangle} + awh^{r(04, neu)} \lambda^{CONSUMER^{11}\langle 04, neu \rangle} - \overline{p}^{tax(04)} \left( -\lambda^{CONSUMER^{12}\langle 04 \rangle} \right) \right) = 0 \quad (16.788)$$

$$-scale^{(05)}\lambda^{CONSUMER^1(05)} + p^1 \left( -\lambda^{CONSUMER^{12}(05)} + \alpha h^{b(05)}\lambda^{CONSUMER^{12}(05)} + \alpha h^{r(05,eu)}\lambda^{CONSUMER^{11}(05,eu)} + \alpha h^{r(05,neu)}\lambda^{CONSUMER^{11}(05,neu)} - \dot{p}t^{tax(05)} \left( -\lambda^{CONSUMER^{12}(05)} \right. \right. \\ \left. \left. (16.789) \right. \right.$$

$$-scale^{(06)}\lambda^{CONSUMER^1(06)} + p^1 \left( -\lambda^{CONSUMER^{12}(06)} + \alpha h^{b(06)}\lambda^{CONSUMER^{12}(06)} + \alpha h^{r(06,eu)}\lambda^{CONSUMER^{11}(06,eu)} + \alpha h^{r(06,neu)}\lambda^{CONSUMER^{11}(06,neu)} - \dot{p}t^{tax(06)} \left( -\lambda^{CONSUMER^{12}(06)} \right. \right. \\ \left. \left. (16.790) \right. \right.$$

$$-scale^{(07)}\lambda^{CONSUMER^1(07)} + p^1 \left( -\lambda^{CONSUMER^{12}(07)} + \alpha h^{b(07)}\lambda^{CONSUMER^{12}(07)} + \alpha h^{r(07,eu)}\lambda^{CONSUMER^{11}(07,eu)} + \alpha h^{r(07,neu)}\lambda^{CONSUMER^{11}(07,neu)} - \dot{p}t^{tax(07)} \left( -\lambda^{CONSUMER^{12}(07)} \right. \right. \\ \left. \left. (16.791) \right. \right.$$

$$-scale^{(08)}\lambda^{CONSUMER^1(08)} + p^1 \left( -\lambda^{CONSUMER^{12}(08)} + \alpha h^{b(08)}\lambda^{CONSUMER^{12}(08)} + \alpha h^{r(08,eu)}\lambda^{CONSUMER^{11}(08,eu)} + \alpha h^{r(08,neu)}\lambda^{CONSUMER^{11}(08,neu)} - \dot{p}t^{tax(08)} \left( -\lambda^{CONSUMER^{12}(08)} \right. \right. \\ \left. \left. (16.792) \right. \right.$$

$$-scale^{(09)}\lambda^{CONSUMER^1(09)} + p^1 \left( -\lambda^{CONSUMER^{12}(09)} + \alpha h^{b(09)}\lambda^{CONSUMER^{12}(09)} + \alpha h^{r(09,eu)}\lambda^{CONSUMER^{11}(09,eu)} + \alpha h^{r(09,neu)}\lambda^{CONSUMER^{11}(09,neu)} - \dot{p}t^{tax(09)} \left( -\lambda^{CONSUMER^{12}(09)} \right. \right. \\ \left. \left. (16.793) \right. \right.$$

$$-scale^{(10)}\lambda^{CONSUMER^1(10)} + p^1 \left( -\lambda^{CONSUMER^{12}(10)} + \alpha h^{b(10)}\lambda^{CONSUMER^{12}(10)} + \alpha h^{r(10,eu)}\lambda^{CONSUMER^{11}(10,eu)} + \alpha h^{r(10,neu)}\lambda^{CONSUMER^{11}(10,neu)} - \dot{p}t^{tax(10)} \left( -\lambda^{CONSUMER^{12}(10)} \right. \right. \\ \left. \left. (16.794) \right. \right.$$

$$-\dot{p}t^{free} + BIINC^{(01)} - PII^{base(01)} - \alpha ip^1 L^{(01)} = 0 \quad (16.795)$$

$$-\dot{p}t^{free} + BIINC^{(02)} - PII^{base(02)} - \alpha ip^1 L^{(02)} = 0 \quad (16.796)$$

$$-\dot{p}t^{free} + BIINC^{(03)} - PII^{base(03)} - \alpha ip^1 L^{(03)} = 0 \quad (16.797)$$

$$-\dot{p}t^{free} + BIINC^{(04)} - PII^{base(04)} - \alpha ip^1 L^{(04)} = 0 \quad (16.798)$$

$$-\dot{p}t^{free} + BIINC^{(05)} - PII^{base(05)} - \alpha ip^1 L^{(05)} = 0 \quad (16.799)$$

$$-\dot{p}t^{free} + BIINC^{(06)} - PII^{base(06)} - \alpha ip^1 L^{(06)} = 0 \quad (16.800)$$

$$-\dot{p}t^{free} + BIINC^{(07)} - PII^{base(07)} - \alpha ip^1 L^{(07)} = 0 \quad (16.801)$$

$$-\dot{p}t^{free} + BIINC^{(08)} - PII^{base(08)} - \alpha ip^1 L^{(08)} = 0 \quad (16.802)$$

$$-\dot{p}t^{free} + BIINC^{(09)} - PII^{base(09)} - \alpha ip^1 L^{(09)} = 0 \quad (16.803)$$

$$-\dot{p}t^{free} + BIINC^{(10)} - PII^{base(10)} - \alpha ip^1 L^{(10)} = 0 \quad (16.804)$$

$$DEM^{GOV} - EXP^{GOV} + SUB + TRAN^{GOV} = 0 \quad (16.805)$$

$$-BIINC^{(01)} + TINSTH^{(01)} + p^k K^{(01)} + p^1 L^{(01)} = 0 \quad (16.806)$$

$$-BIINC^{(02)} + TINSTH^{(02)} + p^k K^{(02)} + p^1 L^{(02)} = 0 \quad (16.807)$$

$$-BTINC^{(03)} + TINSTH^{(03)} + p^k K^{(03)} + p^l L^{(03)} = 0 \quad (16.808)$$

$$-BTINC^{(04)} + TINSTH^{(04)} + p^k K^{(04)} + p^l L^{(04)} = 0 \quad (16.809)$$

$$-BTINC^{(05)} + TINSTH^{(05)} + p^k K^{(05)} + p^l L^{(05)} = 0 \quad (16.810)$$

$$-BTINC^{(06)} + TINSTH^{(06)} + p^k K^{(06)} + p^l L^{(06)} = 0 \quad (16.811)$$

$$-BTINC^{(07)} + TINSTH^{(07)} + p^k K^{(07)} + p^l L^{(07)} = 0 \quad (16.812)$$

$$-BTINC^{(08)} + TINSTH^{(08)} + p^k K^{(08)} + p^l L^{(08)} = 0 \quad (16.813)$$

$$-BTINC^{(09)} + TINSTH^{(09)} + p^k K^{(09)} + p^l L^{(09)} = 0 \quad (16.814)$$

$$-BTINC^{(10)} + TINSTH^{(10)} + p^k K^{(10)} + p^l L^{(10)} = 0 \quad (16.815)$$

$$\Pi^{EXP(A)} + p^{for(eu)} EXP^{(eu,A)} + p^{for(neu)} EXP^{(neu,A)} - p^{exp(A)} EXPORT^{(A)} = 0 \quad (16.816)$$

$$\Pi^{EXP(B)} + p^{for(eu)} EXP^{(eu,B)} + p^{for(neu)} EXP^{(neu,B)} - p^{exp(B)} EXPORT^{(B)} = 0 \quad (16.817)$$

$$\Pi^{EXP(C)} + p^{for(eu)} EXP^{(eu,C)} + p^{for(neu)} EXP^{(neu,C)} - p^{exp(C)} EXPORT^{(C)} = 0 \quad (16.818)$$

$$\Pi^{EXP(D)} + p^{for(eu)} EXP^{(eu,D)} + p^{for(neu)} EXP^{(neu,D)} - p^{exp(D)} EXPORT^{(D)} = 0 \quad (16.819)$$

$$\Pi^{EXP(E)} + p^{for(eu)} EXP^{(eu,E)} + p^{for(neu)} EXP^{(neu,E)} - p^{exp(E)} EXPORT^{(E)} = 0 \quad (16.820)$$

$$\Pi^{EXP(F)} + p^{for(eu)} EXP^{(eu,F)} + p^{for(neu)} EXP^{(neu,F)} - p^{exp(F)} EXPORT^{(F)} = 0 \quad (16.821)$$

$$\Pi^{EXP(G)} + p^{for(eu)} EXP^{(eu,G)} + p^{for(neu)} EXP^{(neu,G)} - p^{exp(G)} EXPORT^{(G)} = 0 \quad (16.822)$$

$$\Pi^{EXP(H)} + p^{for(eu)} EXP^{(eu,H)} + p^{for(neu)} EXP^{(neu,H)} - p^{exp(H)} EXPORT^{(H)} = 0 \quad (16.823)$$

$$\Pi^{EXP(I)} + p^{for(eu)} EXP^{(eu,I)} + p^{for(neu)} EXP^{(neu,I)} - p^{exp(I)} EXPORT^{(I)} = 0 \quad (16.824)$$

$$\Pi^{EXP(J)} + p^{for(eu)} EXP^{(eu,J)} + p^{for(neu)} EXP^{(neu,J)} - p^{exp(J)} EXPORT^{(J)} = 0 \quad (16.825)$$

$$\Pi^{EXP(K)} + p^{for(eu)} EXP^{(eu,K)} + p^{for(neu)} EXP^{(neu,K)} - p^{exp(K)} EXPORT^{(K)} = 0 \quad (16.826)$$

$$\Pi^{Y(A)} - p^{(A)} Y^{(A)} + p^{exp(A)} EXPORT^{(A)} + p^{home(A)} Y^{HOME(A)} = 0 \quad (16.827)$$

$$\Pi^{Y(B)} - p^{(B)} Y^{(B)} + p^{exp(B)} EXPORT^{(B)} + p^{home(B)} Y^{HOME(B)} = 0 \quad (16.828)$$

$$\Pi^{Y(C)} - p^{(C)} Y^{(C)} + p^{exp(C)} EXPORT^{(C)} + p^{home(C)} Y^{HOME(C)} = 0 \quad (16.829)$$

$$\Pi^{Y(D)} - p^{(D)} Y^{(D)} + p^{exp(D)} EXPORT^{(D)} + p^{home(D)} Y^{HOME(D)} = 0 \quad (16.830)$$

$$\Pi^{Y(E)} - p^{(E)} Y^{(E)} + p^{exp(E)} EXPORT^{(E)} + p^{home(E)} Y^{HOME(E)} = 0 \quad (16.831)$$





$$\Pi^{\text{ARM}^{(E)}} + p^{\text{home}^{(E)}} Y^{\text{HOME}^{(E)}} + p^{\text{imp}^{(E)}} \text{IMPORT}^{(E)} - p^{\text{arm}^{(E)}} \text{ARM}^{(E)} = 0 \quad (16.853)$$

$$\Pi^{\text{ARM}^{(F)}} + p^{\text{home}^{(F)}} Y^{\text{HOME}^{(F)}} + p^{\text{imp}^{(F)}} \text{IMPORT}^{(F)} - p^{\text{arm}^{(F)}} \text{ARM}^{(F)} = 0 \quad (16.854)$$

$$\Pi^{\text{ARM}^{(G)}} + p^{\text{home}^{(G)}} Y^{\text{HOME}^{(G)}} + p^{\text{imp}^{(G)}} \text{IMPORT}^{(G)} - p^{\text{arm}^{(G)}} \text{ARM}^{(G)} = 0 \quad (16.855)$$

$$\Pi^{\text{ARM}^{(H)}} + p^{\text{home}^{(H)}} Y^{\text{HOME}^{(H)}} + p^{\text{imp}^{(H)}} \text{IMPORT}^{(H)} - p^{\text{arm}^{(H)}} \text{ARM}^{(H)} = 0 \quad (16.856)$$

$$\Pi^{\text{ARM}^{(I)}} + p^{\text{home}^{(I)}} Y^{\text{HOME}^{(I)}} + p^{\text{imp}^{(I)}} \text{IMPORT}^{(I)} - p^{\text{arm}^{(I)}} \text{ARM}^{(I)} = 0 \quad (16.857)$$

$$\Pi^{\text{ARM}^{(J)}} + p^{\text{home}^{(J)}} Y^{\text{HOME}^{(J)}} + p^{\text{imp}^{(J)}} \text{IMPORT}^{(J)} - p^{\text{arm}^{(J)}} \text{ARM}^{(J)} = 0 \quad (16.858)$$

$$\Pi^{\text{ARM}^{(K)}} + p^{\text{home}^{(K)}} Y^{\text{HOME}^{(K)}} + p^{\text{imp}^{(K)}} \text{IMPORT}^{(K)} - p^{\text{arm}^{(K)}} \text{ARM}^{(K)} = 0 \quad (16.859)$$

$$\text{THBANK}^{(01)} - \text{TRAN}^{(01)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(01,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(01,neu)} = 0 \quad (16.860)$$

$$\text{THBANK}^{(02)} - \text{TRAN}^{(02)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(02,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(02,neu)} = 0 \quad (16.861)$$

$$\text{THBANK}^{(03)} - \text{TRAN}^{(03)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(03,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(03,neu)} = 0 \quad (16.862)$$

$$\text{THBANK}^{(04)} - \text{TRAN}^{(04)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(04,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(04,neu)} = 0 \quad (16.863)$$

$$\text{THBANK}^{(05)} - \text{TRAN}^{(05)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(05,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(05,neu)} = 0 \quad (16.864)$$

$$\text{THBANK}^{(06)} - \text{TRAN}^{(06)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(06,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(06,neu)} = 0 \quad (16.865)$$

$$\text{THBANK}^{(07)} - \text{TRAN}^{(07)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(07,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(07,neu)} = 0 \quad (16.866)$$

$$\text{THBANK}^{(08)} - \text{TRAN}^{(08)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(08,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(08,neu)} = 0 \quad (16.867)$$

$$\text{THBANK}^{(09)} - \text{TRAN}^{(09)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(09,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(09,neu)} = 0 \quad (16.868)$$

$$\text{THBANK}^{(10)} - \text{TRAN}^{(10)} + ex^{\text{rate}^{(eu)}} \text{THROW}^{(10,eu)} + ex^{\text{rate}^{(neu)}} \text{THROW}^{(10,neu)} = 0 \quad (16.869)$$

$$\text{TBANKH}^{(01)} + \text{TFIRMH}^{(01)} + \text{TGOVH}^{(01)} - \text{TINSTH}^{(01)} + \text{TROWH}^{(eu,01)} + \text{TROWH}^{(neu,01)} = 0 \quad (16.870)$$

$$\text{TBANKH}^{(02)} + \text{TFIRMH}^{(02)} + \text{TGOVH}^{(02)} - \text{TINSTH}^{(02)} + \text{TROWH}^{(eu,02)} + \text{TROWH}^{(neu,02)} = 0 \quad (16.871)$$

$$\text{TBANKH}^{(03)} + \text{TFIRMH}^{(03)} + \text{TGOVH}^{(03)} - \text{TINSTH}^{(03)} + \text{TROWH}^{(eu,03)} + \text{TROWH}^{(neu,03)} = 0 \quad (16.872)$$

$$\text{TBANKH}^{(04)} + \text{TFIRMH}^{(04)} + \text{TGOVH}^{(04)} - \text{TINSTH}^{(04)} + \text{TROWH}^{(eu,04)} + \text{TROWH}^{(neu,04)} = 0 \quad (16.873)$$

$$\text{TBANKH}^{(05)} + \text{TFIRMH}^{(05)} + \text{TGOVH}^{(05)} - \text{TINSTH}^{(05)} + \text{TROWH}^{(eu,05)} + \text{TROWH}^{(neu,05)} = 0 \quad (16.874)$$

$$\text{TBANKH}^{(06)} + \text{TFIRMH}^{(06)} + \text{TGOVH}^{(06)} - \text{TINSTH}^{(06)} + \text{TROWH}^{(eu,06)} + \text{TROWH}^{(neu,06)} = 0 \quad (16.875)$$

$$\text{TBANKH}^{(07)} + \text{TFIRMH}^{(07)} + \text{TGOVH}^{(07)} - \text{TINSTH}^{(07)} + \text{TROWH}^{(eu,07)} + \text{TROWH}^{(neu,07)} = 0 \quad (16.876)$$

$$TBANKH^{(08)} + TFIRMH^{(08)} + TGOVH^{(08)} - TINSTH^{(08)} + TROWH^{(eu,08)} + TROWH^{(neu,08)} = 0 \quad (16.877)$$

$$TBANKH^{(09)} + TFIRMH^{(09)} + TGOVH^{(09)} - TINSTH^{(09)} + TROWH^{(eu,09)} + TROWH^{(neu,09)} = 0 \quad (16.878)$$

$$TBANKH^{(10)} + TFIRMH^{(10)} + TGOVH^{(10)} - TINSTH^{(10)} + TROWH^{(eu,10)} + TROWH^{(neu,10)} = 0 \quad (16.879)$$

$$-BTINC^{FIRM} + PROFIT + TBANKFIRM + TGOVFIRM + TROWFIRM^{(eu)} + TROWFIRM^{(neu)} + p^k K^{FIRM} = 0 \quad (16.880)$$

$$CIT + EXCISE + IMTAX - INC^{GOV} + PIT + SOCTAX + STAX + TROWGOV + VAT = 0 \quad (16.881)$$

$$-LS + scale^{(01)} L^{(01)} + scale^{(02)} L^{(02)} + scale^{(03)} L^{(03)} + scale^{(04)} L^{(04)} + scale^{(05)} L^{(05)} + scale^{(06)} L^{(06)} + scale^{(07)} L^{(07)} + scale^{(08)} L^{(08)} + scale^{(09)} L^{(09)} + scale^{(10)} L^{(10)} = 0 \quad (16.882)$$

$$-PIT + pit^{tax(01)} scale^{(01)} PIT^{base(01)} + pit^{tax(02)} scale^{(02)} PIT^{base(02)} + pit^{tax(03)} scale^{(03)} PIT^{base(03)} + pit^{tax(04)} scale^{(04)} PIT^{base(04)} + pit^{tax(05)} scale^{(05)} PIT^{base(05)} + pit^{tax(06)} scale^{(06)} PIT^{base(06)} + pit^{tax(07)} scale^{(07)} PIT^{base(07)} + pit^{tax(08)} scale^{(08)} PIT^{base(08)} + pit^{tax(09)} scale^{(09)} PIT^{base(09)} + pit^{tax(10)} scale^{(10)} PIT^{base(10)} = 0 \quad (16.883)$$

$$-DEM^{GOV} + p^{cons(A)} D^{GOV(A)} + p^{cons(B)} D^{GOV(B)} + p^{cons(C)} D^{GOV(C)} + p^{cons(D)} D^{GOV(D)} + p^{cons(E)} D^{GOV(E)} + p^{cons(F)} D^{GOV(F)} + p^{cons(G)} D^{GOV(G)} + p^{cons(H)} D^{GOV(H)} + p^{cons(I)} D^{GOV(I)} + p^{cons(J)} D^{GOV(J)} + p^{cons(K)} D^{GOV(K)} = 0 \quad (16.884)$$

$$-EXCISE + EXCISE^{(A)} + EXCISE^{(B)} + EXCISE^{(C)} + EXCISE^{(D)} + EXCISE^{(E)} + EXCISE^{(F)} + EXCISE^{(G)} + EXCISE^{(H)} + EXCISE^{(I)} + EXCISE^{(J)} + EXCISE^{(K)} = 0 \quad (16.885)$$

$$-KS + K^{(A)} + K^{(B)} + K^{(C)} + K^{(D)} + K^{(E)} + K^{(F)} + K^{(G)} + K^{(H)} + K^{(I)} + K^{(J)} + K^{(K)} = 0 \quad (16.886)$$

$$-PROFIT + \pi^{(A)} + \pi^{(B)} + \pi^{(C)} + \pi^{(D)} + \pi^{(E)} + \pi^{(F)} + \pi^{(G)} + \pi^{(H)} + \pi^{(I)} + \pi^{(J)} + \pi^{(K)} = 0 \quad (16.887)$$

$$-STAX + TAX^s(A) + TAX^s(B) + TAX^s(C) + TAX^s(D) + TAX^s(E) + TAX^s(F) + TAX^s(G) + TAX^s(H) + TAX^s(I) + TAX^s(J) + TAX^s(K) = 0 \quad (16.888)$$

$$-VAT + VAT^{(A)} + VAT^{(B)} + VAT^{(C)} + VAT^{(D)} + VAT^{(E)} + VAT^{(F)} + VAT^{(G)} + VAT^{(H)} + VAT^{(I)} + VAT^{(J)} + VAT^{(K)} = 0 \quad (16.889)$$

$$TBANKFIRM - TRAN^{BANK} + scale^{(01)} TBANKH^{(01)} + scale^{(02)} TBANKH^{(02)} + scale^{(03)} TBANKH^{(03)} + scale^{(04)} TBANKH^{(04)} + scale^{(05)} TBANKH^{(05)} + scale^{(06)} TBANKH^{(06)} + scale^{(07)} TBANKH^{(07)} + scale^{(08)} TBANKH^{(08)} + scale^{(09)} TBANKH^{(09)} + scale^{(10)} TBANKH^{(10)} = 0 \quad (16.890)$$

$$TFIRMBANK - TRAN^{FIRM} + scale^{(01)} TFIRMH^{(01)} + scale^{(02)} TFIRMH^{(02)} + scale^{(03)} TFIRMH^{(03)} + scale^{(04)} TFIRMH^{(04)} + scale^{(05)} TFIRMH^{(05)} + scale^{(06)} TFIRMH^{(06)} + scale^{(07)} TFIRMH^{(07)} + scale^{(08)} TFIRMH^{(08)} + scale^{(09)} TFIRMH^{(09)} + scale^{(10)} TFIRMH^{(10)} = 0 \quad (16.891)$$

$$-INC^{(01)} + SAV^{(01)} + TRAN^{(01)} + p^{cons(A)} D^{(A,01)} + p^{cons(B)} D^{(B,01)} + p^{cons(C)} D^{(C,01)} + p^{cons(D)} D^{(D,01)} + p^{cons(E)} D^{(E,01)} + p^{cons(F)} D^{(F,01)} + p^{cons(G)} D^{(G,01)} + p^{cons(H)} D^{(H,01)} + p^{cons(I)} D^{(I,01)} + p^{cons(J)} D^{(J,01)} + p^{cons(K)} D^{(K,01)} = 0 \quad (16.892)$$

$$-INC^{(02)} + SAV^{(02)} + TRAN^{(02)} + p^{cons(A)} D^{(A,02)} + p^{cons(B)} D^{(B,02)} + p^{cons(C)} D^{(C,02)} + p^{cons(D)} D^{(D,02)} + p^{cons(E)} D^{(E,02)} + p^{cons(F)} D^{(F,02)} + p^{cons(G)} D^{(G,02)} + p^{cons(H)} D^{(H,02)} + p^{cons(I)} D^{(I,02)} + p^{cons(J)} D^{(J,02)} + p^{cons(K)} D^{(K,02)} = 0 \quad (16.893)$$

$$-INC^{(03)} + SAV^{(03)} + TRAN^{(03)} + p^{cons(A)} D^{(A,03)} + p^{cons(B)} D^{(B,03)} + p^{cons(C)} D^{(C,03)} + p^{cons(D)} D^{(D,03)} + p^{cons(E)} D^{(E,03)} + p^{cons(F)} D^{(F,03)} + p^{cons(G)} D^{(G,03)} + p^{cons(H)} D^{(H,03)} + p^{cons(I)} D^{(I,03)} + p^{cons(J)} D^{(J,03)} + p^{cons(K)} D^{(K,03)} = 0 \quad (16.894)$$

$$-INC^{(04)} + SAV^{(04)} + TRAN^{(04)} + p^{cons(A)} D^{(A,04)} + p^{cons(B)} D^{(B,04)} + p^{cons(C)} D^{(C,04)} + p^{cons(D)} D^{(D,04)} + p^{cons(E)} D^{(E,04)} + p^{cons(F)} D^{(F,04)} + p^{cons(G)} D^{(G,04)} + p^{cons(H)} D^{(H,04)} + p^{cons(I)} D^{(I,04)} + p^{cons(J)} D^{(J,04)} + p^{cons(K)} D^{(K,04)} = 0 \quad (16.895)$$

$$-INC^{(05)} + SAV^{(05)} + TRAN^{(05)} + p^{cons(A)} D^{(A,05)} + p^{cons(B)} D^{(B,05)} + p^{cons(C)} D^{(C,05)} + p^{cons(D)} D^{(D,05)} + p^{cons(E)} D^{(E,05)} + p^{cons(F)} D^{(F,05)} + p^{cons(G)} D^{(G,05)} + p^{cons(H)} D^{(H,05)} + p^{cons(I)} D^{(I,05)} + p^{cons(J)} D^{(J,05)} + p^{cons(K)} D^{(K,05)} = 0 \quad (16.896)$$

$$-INC^{(06)} + SAV^{(06)} + TRAN^{(06)} + p^{cons(A)} D^{(A,06)} + p^{cons(B)} D^{(B,06)} + p^{cons(C)} D^{(C,06)} + p^{cons(D)} D^{(D,06)} + p^{cons(E)} D^{(E,06)} + p^{cons(F)} D^{(F,06)} + p^{cons(G)} D^{(G,06)} + p^{cons(H)} D^{(H,06)} + p^{cons(I)} D^{(I,06)} + p^{cons(J)} D^{(J,06)} + p^{cons(K)} D^{(K,06)} = 0 \quad (16.897)$$

$$\begin{aligned}
& -INC^{(07)} + SAV^{(07)} + TRAN^{(07)} + p^{\text{cons(A)}} D^{(A,07)} + p^{\text{cons(B)}} D^{(B,07)} + p^{\text{cons(C)}} D^{(C,07)} + p^{\text{cons(D)}} D^{(D,07)} + p^{\text{cons(E)}} D^{(E,07)} + p^{\text{cons(F)}} D^{(F,07)} + p^{\text{cons(G)}} D^{(G,07)} + p^{\text{cons(H)}} D^{(H,07)} + p^{\text{cons(I)}} D^{(I,07)} \\
& \hspace{20em} (16.898) \\
& -INC^{(08)} + SAV^{(08)} + TRAN^{(08)} + p^{\text{cons(A)}} D^{(A,08)} + p^{\text{cons(B)}} D^{(B,08)} + p^{\text{cons(C)}} D^{(C,08)} + p^{\text{cons(D)}} D^{(D,08)} + p^{\text{cons(E)}} D^{(E,08)} + p^{\text{cons(F)}} D^{(F,08)} + p^{\text{cons(G)}} D^{(G,08)} + p^{\text{cons(H)}} D^{(H,08)} + p^{\text{cons(I)}} D^{(I,08)} \\
& \hspace{20em} (16.899) \\
& -INC^{(09)} + SAV^{(09)} + TRAN^{(09)} + p^{\text{cons(A)}} D^{(A,09)} + p^{\text{cons(B)}} D^{(B,09)} + p^{\text{cons(C)}} D^{(C,09)} + p^{\text{cons(D)}} D^{(D,09)} + p^{\text{cons(E)}} D^{(E,09)} + p^{\text{cons(F)}} D^{(F,09)} + p^{\text{cons(G)}} D^{(G,09)} + p^{\text{cons(H)}} D^{(H,09)} + p^{\text{cons(I)}} D^{(I,09)} \\
& \hspace{20em} (16.900) \\
& -INC^{(10)} + SAV^{(10)} + TRAN^{(10)} + p^{\text{cons(A)}} D^{(A,10)} + p^{\text{cons(B)}} D^{(B,10)} + p^{\text{cons(C)}} D^{(C,10)} + p^{\text{cons(D)}} D^{(D,10)} + p^{\text{cons(E)}} D^{(E,10)} + p^{\text{cons(F)}} D^{(F,10)} + p^{\text{cons(G)}} D^{(G,10)} + p^{\text{cons(H)}} D^{(H,10)} + p^{\text{cons(I)}} D^{(I,10)} \\
& \hspace{20em} (16.901) \\
& -TRAN^{(eu)} + TROWFIRM^{(eu)} + TROWBANK^{(eu)} + TROWGOV^{(eu)} + scale^{(01)} TROWH^{(eu,01)} + scale^{(02)} TROWH^{(eu,02)} + scale^{(03)} TROWH^{(eu,03)} + scale^{(04)} TROWH^{(eu,04)} + scale^{(05)} TROWH^{(eu,05)} \\
& \hspace{20em} (16.902) \\
& -TRAN^{(neu)} + TROWFIRM^{(neu)} + TROWBANK^{(neu)} + TROWGOV^{(neu)} + scale^{(01)} TROWH^{(neu,01)} + scale^{(02)} TROWH^{(neu,02)} + scale^{(03)} TROWH^{(neu,03)} + scale^{(04)} TROWH^{(neu,04)} + scale^{(05)} TROWH^{(neu,05)} \\
& \hspace{20em} (16.903) \\
& TGOVFIRM + TGOVBANK - TRAN^{GOV} + scale^{(01)} TGOVH^{(01)} + scale^{(02)} TGOVH^{(02)} + scale^{(03)} TGOVH^{(03)} + scale^{(04)} TGOVH^{(04)} + scale^{(05)} TGOVH^{(05)} + scale^{(06)} TGOVH^{(06)} + scale^{(07)} TGOVH^{(07)} \\
& \hspace{20em} (16.904) \\
& -BTINC^{BANK} + TFIRMBANK + TGOVBANK + TROWBANK^{(eu)} + TROWBANK^{(neu)} + scale^{(01)} THBANK^{(01)} + scale^{(02)} THBANK^{(02)} + scale^{(03)} THBANK^{(03)} + scale^{(04)} THBANK^{(04)} + scale^{(05)} THBANK^{(05)} \\
& \hspace{20em} (16.905) \\
& -SAV + SAV^{FIRM} + SAV^{BANK} + SAV^{GOV} + SAV^{(eu)} + SAV^{(neu)} + scale^{(01)} SAV^{(01)} + scale^{(02)} SAV^{(02)} + scale^{(03)} SAV^{(03)} + scale^{(04)} SAV^{(04)} + scale^{(05)} SAV^{(05)} + scale^{(06)} SAV^{(06)} + scale^{(07)} SAV^{(07)} + scale^{(08)} SAV^{(08)} \\
& \hspace{20em} (16.906) \\
& -L^{(A)} - L^{(B)} - L^{(C)} - L^{(D)} - L^{(E)} - L^{(F)} - L^{(G)} - L^{(H)} - L^{(I)} - L^{(J)} - L^{(K)} + scale^{(01)} L^{(01)} + scale^{(02)} L^{(02)} + scale^{(03)} L^{(03)} + scale^{(04)} L^{(04)} + scale^{(05)} L^{(05)} + scale^{(06)} L^{(06)} + scale^{(07)} L^{(07)} + scale^{(08)} L^{(08)} \\
& \hspace{20em} (16.907) \\
& -IMTAX + im^{\text{tax(eu,A)}} p^{\text{for(eu)}} ex^{\text{rate(eu)}} IMP^{(eu,A)} + im^{\text{tax(eu,B)}} p^{\text{for(eu)}} ex^{\text{rate(eu)}} IMP^{(eu,B)} + im^{\text{tax(eu,C)}} p^{\text{for(eu)}} ex^{\text{rate(eu)}} IMP^{(eu,C)} + im^{\text{tax(eu,D)}} p^{\text{for(eu)}} ex^{\text{rate(eu)}} IMP^{(eu,D)} + im^{\text{tax(eu,E)}} p^{\text{for(eu)}} ex^{\text{rate(eu)}} IMP^{(eu,E)} \\
& \hspace{20em} (16.908) \\
& -SUB + SUB^s(A) + SUB^s(B) + SUB^s(C) + SUB^s(D) + SUB^s(E) + SUB^s(F) + SUB^s(G) + SUB^s(H) + SUB^s(I) + SUB^s(J) + SUB^s(K) + SUB^p(A) + SUB^p(B) + SUB^p(C) + SUB^p(D) + SUB^p(E) + SUB^p(F) + SUB^p(G) + SUB^p(H) + SUB^p(I) + SUB^p(J) + SUB^p(K) \\
& \hspace{20em} (16.909) \\
& -ARM^{(A)} + D^{GOV(A)} + INV^{(A)} + X^{(A,A)} + X^{(A,B)} + X^{(A,C)} + X^{(A,D)} + X^{(A,E)} + X^{(A,F)} + X^{(A,G)} + X^{(A,H)} + X^{(A,I)} + X^{(A,J)} + X^{(A,K)} + scale^{(01)} D^{(A,01)} + scale^{(02)} D^{(A,02)} + scale^{(03)} D^{(A,03)} + scale^{(04)} D^{(A,04)} + scale^{(05)} D^{(A,05)} + scale^{(06)} D^{(A,06)} + scale^{(07)} D^{(A,07)} + scale^{(08)} D^{(A,08)} \\
& \hspace{20em} (16.910) \\
& -ARM^{(B)} + D^{GOV(B)} + INV^{(B)} + X^{(B,A)} + X^{(B,B)} + X^{(B,C)} + X^{(B,D)} + X^{(B,E)} + X^{(B,F)} + X^{(B,G)} + X^{(B,H)} + X^{(B,I)} + X^{(B,J)} + X^{(B,K)} + scale^{(01)} D^{(B,01)} + scale^{(02)} D^{(B,02)} + scale^{(03)} D^{(B,03)} + scale^{(04)} D^{(B,04)} + scale^{(05)} D^{(B,05)} + scale^{(06)} D^{(B,06)} + scale^{(07)} D^{(B,07)} + scale^{(08)} D^{(B,08)} \\
& \hspace{20em} (16.911) \\
& -ARM^{(C)} + D^{GOV(C)} + INV^{(C)} + X^{(C,A)} + X^{(C,B)} + X^{(C,C)} + X^{(C,D)} + X^{(C,E)} + X^{(C,F)} + X^{(C,G)} + X^{(C,H)} + X^{(C,I)} + X^{(C,J)} + X^{(C,K)} + scale^{(01)} D^{(C,01)} + scale^{(02)} D^{(C,02)} + scale^{(03)} D^{(C,03)} + scale^{(04)} D^{(C,04)} + scale^{(05)} D^{(C,05)} + scale^{(06)} D^{(C,06)} + scale^{(07)} D^{(C,07)} + scale^{(08)} D^{(C,08)} \\
& \hspace{20em} (16.912) \\
& -ARM^{(D)} + D^{GOV(D)} + INV^{(D)} + X^{(D,A)} + X^{(D,B)} + X^{(D,C)} + X^{(D,D)} + X^{(D,E)} + X^{(D,F)} + X^{(D,G)} + X^{(D,H)} + X^{(D,I)} + X^{(D,J)} + X^{(D,K)} + scale^{(01)} D^{(D,01)} + scale^{(02)} D^{(D,02)} + scale^{(03)} D^{(D,03)} + scale^{(04)} D^{(D,04)} + scale^{(05)} D^{(D,05)} + scale^{(06)} D^{(D,06)} + scale^{(07)} D^{(D,07)} + scale^{(08)} D^{(D,08)} \\
& \hspace{20em} (16.913) \\
& -ARM^{(E)} + D^{GOV(E)} + INV^{(E)} + X^{(E,A)} + X^{(E,B)} + X^{(E,C)} + X^{(E,D)} + X^{(E,E)} + X^{(E,F)} + X^{(E,G)} + X^{(E,H)} + X^{(E,I)} + X^{(E,J)} + X^{(E,K)} + scale^{(01)} D^{(E,01)} + scale^{(02)} D^{(E,02)} + scale^{(03)} D^{(E,03)} + scale^{(04)} D^{(E,04)} + scale^{(05)} D^{(E,05)} + scale^{(06)} D^{(E,06)} + scale^{(07)} D^{(E,07)} + scale^{(08)} D^{(E,08)} \\
& \hspace{20em} (16.914) \\
& -ARM^{(F)} + D^{GOV(F)} + INV^{(F)} + X^{(F,A)} + X^{(F,B)} + X^{(F,C)} + X^{(F,D)} + X^{(F,E)} + X^{(F,F)} + X^{(F,G)} + X^{(F,H)} + X^{(F,I)} + X^{(F,J)} + X^{(F,K)} + scale^{(01)} D^{(F,01)} + scale^{(02)} D^{(F,02)} + scale^{(03)} D^{(F,03)} + scale^{(04)} D^{(F,04)} + scale^{(05)} D^{(F,05)} + scale^{(06)} D^{(F,06)} + scale^{(07)} D^{(F,07)} + scale^{(08)} D^{(F,08)} \\
& \hspace{20em} (16.915)
\end{aligned}$$

