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Index sets

$$SEC = \{A, B, C\}$$

1 CONSUMER

1.1 Optimisation problem

$$\max_{\left(D^{\langle s \rangle}\right)_{s \in SEC}} U = \left(\sum_{s \in SEC} \alpha^{\langle s \rangle} D^{\langle s \rangle^{\omega^{-1}(-1+\omega)}}\right)^{\omega(-1+\omega)^{-1}} \tag{1.1}$$

s.t.:

$$H^{\text{inc}}\left(1-\tau^{\text{h}}\right) = -\sum_{s \in SEC} \pi^{\langle s \rangle} + \sum_{s \in SEC} p^{\langle s \rangle} D^{\langle s \rangle} \quad \left(\lambda^{\text{CONSUMER}^{1}}\right)$$
(1.2)

1.2 Identities

$$H^{\rm inc} = L + TR + p^{\rm k}K \tag{1.3}$$

$$K = p r^{k} (1.4)$$

$$L = p x^{-1} (1.5)$$

1.3 First order conditions

$$s \in SEC: \quad \lambda^{CONSUMER^{1}} p^{\langle s \rangle} + \alpha^{\langle s \rangle} D^{\langle s \rangle^{-1+\omega^{-1}(-1+\omega)}} \left(\sum_{s \in SEC} \alpha^{\langle s \rangle} D^{\langle s \rangle^{\omega^{-1}(-1+\omega)}} \right)^{-1+\omega(-1+\omega)^{-1}} = 0 \quad \left(D^{\langle s \rangle} \right)$$

$$(1.6)$$

2 FIRM $s \in SEC$

2.1 Optimisation problem

$$\max_{Y^{\langle s \rangle}, K^{\langle s \rangle}, L^{\langle s \rangle}, \left(X^{\langle s i, s \rangle}\right)_{si \in SEC}, VA^{\langle s \rangle}, CI^{\langle s \rangle}, T_{pi}^{\langle s \rangle}} \pi^{\langle s \rangle} = T_{pi}^{\langle s \rangle} (1 - \tau)$$

$$(2.1)$$

 $\mathrm{s.t.}$

$$Y^{\langle s \rangle} = \left(\beta^{\text{va}\langle s \rangle} V A^{\langle s \rangle}^{\gamma^{\langle s \rangle} - 1 \left(-1 + \gamma^{\langle s \rangle} \right)} + \beta^{\text{ci}\langle s \rangle} C I^{\langle s \rangle}^{\gamma^{\langle s \rangle} - 1 \left(-1 + \gamma^{\langle s \rangle} \right)} \right)^{\gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle} \right)^{-1}} \quad \left(\lambda^{\text{FIRM}^{1}\langle s \rangle} \right)$$

$$(2.2)$$

$$VA^{\langle s \rangle} = \left(\beta^{\mathbf{k}^{\langle s \rangle}} K^{\langle s \rangle} \gamma^{\langle s \rangle^{-1} \left(-1 + \gamma^{\langle s \rangle} \right)} + \beta^{\mathbf{l}^{\langle s \rangle}} L^{\langle s \rangle} \gamma^{\langle s \rangle^{-1} \left(-1 + \gamma^{\langle s \rangle} \right)} \right)^{\gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle} \right)^{-1}} \quad \left(\lambda^{\text{FIRM}^{2} \langle s \rangle} \right)$$

$$(2.3)$$

$$CI^{\langle s \rangle} = \left(\sum_{\mathbf{s} \in SEC} \chi^{\langle \mathbf{s}, s \rangle} X^{\langle \mathbf{s}, s \rangle} \gamma^{\langle s \rangle - 1} (-1 + \gamma^{\langle s \rangle}) \right)^{\gamma^{\langle s \rangle} (-1 + \gamma^{\langle s \rangle})^{-1}} \qquad \left(\lambda^{\text{FIRM}^{3} \langle s \rangle} \right)$$

$$(2.4)$$

$$Tpi^{\langle s \rangle} = p^{\langle s \rangle} Y^{\langle s \rangle} - L^{\langle s \rangle} \left(1 + t^{l} \right) - p^{k} K^{\langle s \rangle} \left(1 + t^{k} \right) - \sum_{si \in SEC} p^{\langle si \rangle} X^{\langle si, s \rangle} \quad \left(\lambda^{\text{FIRM}^{4} \langle s \rangle} \right)$$

$$(2.5)$$

2.2 First order conditions

$$-\lambda^{\text{FIRM}^{1}\langle s\rangle} + \lambda^{\text{FIRM}^{4}\langle s\rangle} p^{\langle s\rangle} = 0 \quad (Y^{\langle s\rangle})$$
(2.6)

$$-p^{k}\lambda^{\text{FIRM}^{4}\langle s\rangle}\left(1+t^{k}\right)+\beta^{k\langle s\rangle}\lambda^{\text{FIRM}^{2}\langle s\rangle}K^{\langle s\rangle^{-1+\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}\left(\beta^{k\langle s\rangle}K^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}}+\beta^{l\langle s\rangle}L^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}=0 \quad \left(K^{\langle s\rangle}\right)$$

$$\lambda^{\text{FIRM}^{4}\langle s\rangle} \left(-1-t^{\text{l}}\right) + \beta^{\text{l}\langle s\rangle} \lambda^{\text{FIRM}^{2}\langle s\rangle} L^{\langle s\rangle^{-1+\gamma\langle s\rangle^{-1}} \left(-1+\gamma^{\langle s\rangle}\right)} \left(\beta^{\text{k}\langle s\rangle} K^{\langle s\rangle^{\gamma\langle s\rangle^{-1}} \left(-1+\gamma^{\langle s\rangle}\right)} + \beta^{\text{l}\langle s\rangle} L^{\langle s\rangle^{\gamma\langle s\rangle^{-1}} \left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle} \left(-1+\gamma^{\langle s\rangle}\right)^{-1}} = 0 \quad \left(L^{\langle s\rangle}\right) \tag{2.8}$$

$$\vec{s} \in SEC: \quad -\lambda^{\text{FIRM}^{4}\langle s \rangle} p^{\langle \vec{s} \rangle} + \chi^{\langle \vec{s}, s \rangle} \lambda^{\text{FIRM}^{3}\langle s \rangle} X^{\langle \vec{s}, s \rangle^{-1 + \gamma^{\langle s \rangle - 1} \left(-1 + \gamma^{\langle s \rangle} \right)} \left(\sum_{\vec{s} \in SEC} \chi^{\langle \vec{s}, s \rangle} X^{\langle \vec{s}, s \rangle} X^{\langle \vec{s}, s \rangle} \gamma^{\langle s \rangle^{-1} \left(-1 + \gamma^{\langle s \rangle} \right)} \right)^{-1 + \gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle} \right)^{-1}} = 0 \quad \left(X^{\langle \vec{s}, s \rangle} \right)^{-1} = 0 \quad \left(X^{\langle \vec{s}, s \rangle} X^{\langle \vec{s}, s$$

$$-\lambda^{\text{FIRM}^{2}\langle s\rangle} + \beta^{\text{va}\langle s\rangle} \lambda^{\text{FIRM}^{1}\langle s\rangle} V A^{\langle s\rangle^{-1+\gamma\langle s\rangle^{-1}} \left(-1+\gamma^{\langle s\rangle}\right)} \left(\beta^{\text{va}\langle s\rangle} V A^{\langle s\rangle^{\gamma\langle s\rangle^{-1}} \left(-1+\gamma^{\langle s\rangle}\right)} + \beta^{\text{ci}\langle s\rangle} C I^{\langle s\rangle^{\gamma\langle s\rangle^{-1}} \left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle} \left(-1+\gamma^{\langle s\rangle}\right)^{-1}} = 0 \quad \left(V A^{\langle s\rangle}\right)$$

$$(2.10)$$

$$-\lambda^{\text{FIRM}^{3}\langle s\rangle} + \beta^{\text{ci}\langle s\rangle}\lambda^{\text{FIRM}^{1}\langle s\rangle}CI^{\langle s\rangle^{-1+\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}} \left(\beta^{\text{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}} + \beta^{\text{ci}\langle s\rangle}CI^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}} = 0 \quad \left(CI^{\langle s\rangle}\right)$$

$$(2.11)$$

$$1 - \tau - \lambda^{\text{FIRM}^{4\langle s \rangle}} = 0 \quad \left(T p^{\langle s \rangle} \right)$$
 (2.12)

2.3 First order conditions after reduction

$$-p^{\mathbf{k}}\left(1+t^{\mathbf{k}}\right)\left(1-\tau\right)+\beta^{\mathbf{k}\langle s\rangle}\beta^{\mathbf{va}\langle s\rangle}p^{\langle s\rangle}\left(1-\tau\right)K^{\langle s\rangle^{-1+\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}}VA^{\langle s\rangle^{-1+\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}\left(\beta^{\mathbf{k}\langle s\rangle}K^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}+\beta^{\mathbf{l}\langle s\rangle}L^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathbf{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathbf{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathbf{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathbf{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathbf{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}\right)^{-1}$$

$$\left(-1-t^{l}\right)(1-\tau)+\beta^{l\langle s\rangle}\beta^{\mathrm{va}\langle s\rangle}p^{\langle s\rangle}(1-\tau)L^{\langle s\rangle^{-1+\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}VA^{\langle s\rangle^{-1+\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}}\left(\beta^{\mathrm{k}\langle s\rangle}K^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}+\beta^{l\langle s\rangle}L^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}}\left(-1+\gamma^{\langle s\rangle}\right)^{-1+\gamma^{\langle s\rangle}}\left(\beta^{\mathrm{va}\langle s\rangle}VA^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle s\rangle}VA^{\langle s$$

$$\vec{s} \in SEC: \quad -p^{\langle \vec{s} \rangle} (1-\tau) + \beta^{\operatorname{ci}\langle s \rangle} \chi^{\langle \vec{s}, s \rangle} p^{\langle s \rangle} (1-\tau) CI^{\langle s \rangle^{-1+\gamma^{\langle s \rangle^{-1}} \left(-1+\gamma^{\langle s \rangle}\right)}} X^{\langle \vec{s}, s \rangle^{-1+\gamma^{\langle s \rangle^{-1}} \left(-1+\gamma^{\langle s \rangle}\right)}} \left(\beta^{\operatorname{va}\langle s \rangle} VA^{\langle s \rangle^{\gamma^{\langle s \rangle^{-1}} \left(-1+\gamma^{\langle s \rangle}\right)}} + \beta^{\operatorname{ci}\langle s \rangle} CI^{\langle s \rangle^{\gamma^{\langle s \rangle^{-1}} \left(-1+\gamma^{\langle s \rangle}\right)}}\right)^{-1+\gamma^{\langle s \rangle} \left(-1+\gamma^{\langle s \rangle}\right)^{-1}} \left(\sum_{\vec{s} \in S} (1-\tau) CI^{\langle s \rangle^{-1+\gamma^{\langle s \rangle} \left(-1+\gamma^{\langle s \rangle}\right)}} X^{\langle \vec{s}, s \rangle^{-1+\gamma^{\langle s \rangle} \left(-1+\gamma^{\langle s \rangle}\right)}} \left(\beta^{\operatorname{va}\langle s \rangle} VA^{\langle s \rangle^{\gamma^{\langle s \rangle^{-1}} \left(-1+\gamma^{\langle s \rangle}\right)}} + \beta^{\operatorname{ci}\langle s \rangle} CI^{\langle s \rangle^{\gamma^{\langle s \rangle^{-1}} \left(-1+\gamma^{\langle s \rangle}\right)}}\right)^{-1+\gamma^{\langle s \rangle} \left(-1+\gamma^{\langle s \rangle}\right)^{-1}} \left(\sum_{\vec{s} \in S} (1-\tau) CI^{\langle s \rangle} VA^{\langle s \rangle^{-1} \left(-1+\gamma^{\langle s \rangle}\right)} + \beta^{\operatorname{ci}\langle s \rangle} CI^{\langle s \rangle} VA^{\langle s \rangle^{-1} \left(-1+\gamma^{\langle s \rangle}\right)}\right)^{-1+\gamma^{\langle s \rangle} \left(-1+\gamma^{\langle s \rangle}\right)^{-1}} \left(\sum_{\vec{s} \in S} (1-\tau) CI^{\langle s \rangle} VA^{\langle s \rangle} VA^{$$

3 GOVERNMENT

3.1 Identities

$$G^{\rm inc} = TR \tag{3.1}$$

$$G^{\rm inc} = T^{\rm hh} + T^{\rm firms} + T^{\rm lk} \tag{3.2}$$

$$T^{\rm hh} = \tau^{\rm h} H^{\rm inc} \tag{3.3}$$

$$T^{\text{firms}} = \tau \left(\sum_{s \in SEC} T p i^{\langle s \rangle} \right) \tag{3.4}$$

$$T^{\rm lk} = t^{\rm l} \left(\sum_{s \in SEC} L^{\langle si \rangle} \right) + t^{\rm k} p^{\rm k} \left(\sum_{s \in SEC} K^{\langle s \rangle} \right)$$

$$(3.5)$$

4 EQUILIBRIUM

4.1 Identities

$$s \in SEC: \quad Y^{\langle s \rangle} = D^{\langle s \rangle} + \sum_{si \in SEC} X^{\langle s, si \rangle}$$
 (4.1)

$$K = \sum_{s \in SEC} K^{\langle s \rangle} \tag{4.2}$$

5 Equilibrium relationships (before expansion and reduction)

$$pr^{k} - K = 0 (5.1)$$

$$pr^{1} - L = 0 (5.2)$$

$$-G^{\rm inc} + TR = 0 \tag{5.3}$$

$$-K + \sum_{s \in SFC} K^{\langle s \rangle} = 0 \tag{5.4}$$

$$-T^{\rm hh} + \tau^{\rm h}H^{\rm inc} = 0 \tag{5.5}$$

$$-T^{\text{firms}} + \tau \left(\sum_{s \in SFC} T p i^{\langle s \rangle} \right) = 0 \tag{5.6}$$

$$U - \left(\sum_{s \in SEC} \alpha^{\langle s \rangle} D^{\langle s \rangle^{\omega^{-1}(-1+\omega)}}\right)^{\omega(-1+\omega)^{-1}} = 0$$
(5.7)

$$-T^{lk} + t^{l} \left(\sum_{s \in SFC} L^{\langle si \rangle} \right) + t^{k} p^{k} \left(\sum_{s \in SFC} K^{\langle s \rangle} \right) = 0$$
 (5.8)

$$-H^{\text{inc}}\left(1-\tau^{\text{h}}\right) - \sum_{s \in SEC} \pi^{\langle s \rangle} + \sum_{s \in SEC} p^{\langle s \rangle} D^{\langle s \rangle} = 0 \tag{5.9}$$

$$-G^{\rm inc} + T^{\rm hh} + T^{\rm firms} + T^{\rm lk} = 0 {(5.10)}$$

$$-H^{\rm inc} + L + TR + p^{\rm k}K = 0 (5.11)$$

$$s \in SEC: \quad \pi^{\langle s \rangle} - Tpi^{\langle s \rangle} (1 - \tau) = 0$$
 (5.12)

$$s \in SEC: -CI^{\langle s \rangle} + \left(\sum_{\vec{s} \in SEC} \chi^{\langle \vec{s}, s \rangle} X^{\langle \vec{s}, s \rangle} \gamma^{\langle s \rangle^{-1} \left(-1 + \gamma^{\langle s \rangle} \right)} \right)^{\gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle} \right)^{-1}} = 0$$
 (5.13)

$$s \in SEC: -VA^{\langle s \rangle} + \left(\beta^{k \langle s \rangle} K^{\langle s \rangle}^{\gamma^{\langle s \rangle - 1} \left(-1 + \gamma^{\langle s \rangle}\right)} + \beta^{l \langle s \rangle} L^{\langle s \rangle}^{\gamma^{\langle s \rangle - 1} \left(-1 + \gamma^{\langle s \rangle}\right)}\right)^{\gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle}\right)^{-1}} = 0$$

$$(5.14)$$

$$s \in SEC: -Y^{\langle s \rangle} + \left(\beta^{\operatorname{va}\langle s \rangle} V A^{\langle s \rangle^{\gamma^{\langle s \rangle - 1}} \left(-1 + \gamma^{\langle s \rangle}\right)} + \beta^{\operatorname{ci}\langle s \rangle} C I^{\langle s \rangle^{\gamma^{\langle s \rangle - 1}} \left(-1 + \gamma^{\langle s \rangle}\right)}\right)^{\gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle}\right)^{-1}} = 0$$

$$(5.15)$$

$$s \in SEC: \quad \lambda^{CONSUMER^{1}} p^{\langle s \rangle} + \alpha^{\langle s \rangle} D^{\langle s \rangle^{-1+\omega^{-1}(-1+\omega)}} \left(\sum_{s \in SEC} \alpha^{\langle s \rangle} D^{\langle s \rangle^{\omega^{-1}(-1+\omega)}} \right)^{-1+\omega(-1+\omega)^{-1}} = 0$$
 (5.16)

$$s \in SEC: \quad \left(-1-t^{l}\right)(1-\tau)+\beta^{l\langle s\rangle}\beta^{\operatorname{va}\langle s\rangle}p^{\langle s\rangle}\left(1-\tau\right)L^{\langle s\rangle^{-1+\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}VA^{\langle s\rangle^{-1+\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}\left(\beta^{k\langle s\rangle}K^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}+\beta^{l\langle s\rangle}L^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\operatorname{va}\langle s\rangle}K^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}+\beta^{l\langle s\rangle}L^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\operatorname{va}\langle s\rangle}K^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}+\beta^{l\langle s\rangle}L^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\operatorname{va}\langle s\rangle}K^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}+\beta^{l\langle s\rangle}L^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)^{-1}}\left(\beta^{\operatorname{va}\langle s\rangle}K^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}+\beta^{l\langle s\rangle}L^{\langle s\rangle^{\gamma^{\langle s\rangle^{-1}}}\left(-1+\gamma^{\langle s\rangle}\right)}\right)^{-1+\gamma^{\langle s\rangle}\left(-1+\gamma^{\langle s\rangle}\right)}$$

$$s \in SEC: -p^{\mathbf{k}} \left(1 + t^{\mathbf{k}}\right) \left(1 - \tau\right) + \beta^{\mathbf{k}^{\langle s \rangle}} \beta^{\mathbf{va}^{\langle s \rangle}} p^{\langle s \rangle} \left(1 - \tau\right) K^{\langle s \rangle^{-1 + \gamma^{\langle s \rangle - 1}} \left(-1 + \gamma^{\langle s \rangle}\right)} V A^{\langle s \rangle^{-1 + \gamma^{\langle s \rangle} - 1} \left(-1 + \gamma^{\langle s \rangle}\right)} \left(\beta^{\mathbf{k}^{\langle s \rangle}} K^{\langle s \rangle^{\gamma^{\langle s \rangle} - 1} \left(-1 + \gamma^{\langle s \rangle}\right)} + \beta^{\mathbf{l}^{\langle s \rangle}} L^{\langle s \rangle^{\gamma^{\langle s \rangle} - 1} \left(-1 + \gamma^{\langle s \rangle}\right)}\right)^{-1 + \gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle}\right)^{-1}} \left(\beta^{\mathbf{k}^{\langle s \rangle}} K^{\langle s \rangle^{\gamma^{\langle s \rangle} - 1} \left(-1 + \gamma^{\langle s \rangle}\right)} + \beta^{\mathbf{l}^{\langle s \rangle}} L^{\langle s \rangle^{\gamma^{\langle s \rangle} - 1} \left(-1 + \gamma^{\langle s \rangle}\right)}\right)^{-1 + \gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle}\right)^{-1}} \left(\beta^{\mathbf{k}^{\langle s \rangle}} K^{\langle s \rangle^{\gamma^{\langle s \rangle} - 1} \left(-1 + \gamma^{\langle s \rangle}\right)} + \beta^{\mathbf{l}^{\langle s \rangle}} L^{\langle s \rangle^{\gamma^{\langle s \rangle} - 1} \left(-1 + \gamma^{\langle s \rangle}\right)}\right)^{-1 + \gamma^{\langle s \rangle} \left(-1 + \gamma^{\langle s \rangle}\right)^{-1}} \left(\beta^{\mathbf{k}^{\langle s \rangle}} K^{\langle s \rangle} K^{\langle s$$

$$s \in SEC: \quad D^{\langle s \rangle} - Y^{\langle s \rangle} + \sum_{s \in SEC} X^{\langle s, s \rangle} = 0$$
 (5.19)

$$s \in SEC: \quad -Tp^{\langle s \rangle} + p^{\langle s \rangle}Y^{\langle s \rangle} - L^{\langle s \rangle} \left(1 + t^{l}\right) - p^{k}K^{\langle s \rangle} \left(1 + t^{k}\right) - \sum_{s \in SEC} p^{\langle s i \rangle}X^{\langle s i, s \rangle} = 0$$

$$(5.20)$$

$$s \in SEC: \quad \dot{s} \in SEC: \quad \dot{s} \in SEC: \quad -p^{\langle \dot{s} \rangle} (1-\tau) + \beta^{\mathrm{ci}^{\langle \dot{s} \rangle}} \chi^{\langle \dot{s}, \dot{s} \rangle} p^{\langle \dot{s} \rangle} (1-\tau) CI^{\langle \dot{s} \rangle^{-1} + \gamma^{\langle \dot{s} \rangle^{-1}} \left(-1 + \gamma^{\langle \dot{s} \rangle}\right)} \chi^{\langle \dot{s}, \dot{s} \rangle^{-1} + \gamma^{\langle \dot{s} \rangle^{-1}} \left(-1 + \gamma^{\langle \dot{s} \rangle}\right)} \left(\beta^{\mathrm{va}\langle \dot{s} \rangle} V A^{\langle \dot{s} \rangle^{\gamma^{\langle \dot{s} \rangle^{-1}} \left(-1 + \gamma^{\langle \dot{s} \rangle}\right)} + \beta^{\mathrm{ci}^{\langle \dot{s} \rangle}} CI^{\langle \dot{s} \rangle^{\gamma^{\langle \dot{s} \rangle^{-1}} \left(-1 + \gamma^{\langle \dot{s} \rangle}\right)} \right)^{-1 + \gamma^{\langle \dot{s} \rangle} \left(-1 + \gamma^{\langle \dot{s} \rangle}\right)}$$

$$(5.21)$$

6 Equilibrium relationships (after expansion and reduction)

$$px^{k} - K = 0 (6.1)$$

$$px^1 - L = 0 ag{6.2}$$

$$-G^{\rm inc} + TR = 0 \tag{6.3}$$

$$-T^{\rm hh} + \tau^{\rm h}H^{\rm inc} = 0 \tag{6.4}$$

$$-T^{\text{firms}} + \tau \left(T p i^{\langle A \rangle} + T p i^{\langle B \rangle} + T p i^{\langle C \rangle} \right) = 0$$

$$(6.5)$$

$$U - \left(\alpha^{\langle A \rangle} D^{\langle A \rangle^{\omega^{-1}(-1+\omega)}} + \alpha^{\langle B \rangle} D^{\langle B \rangle^{\omega^{-1}(-1+\omega)}} + \alpha^{\langle C \rangle} D^{\langle C \rangle^{\omega^{-1}(-1+\omega)}}\right)^{\omega(-1+\omega)^{-1}} = 0$$

$$(6.6)$$

$$\pi^{\langle A \rangle} - T p \dot{i}^{\langle A \rangle} (1 - \tau) = 0 \tag{6.7}$$

$$\pi^{\langle B \rangle} - T n^{\langle B \rangle} (1 - \tau) = 0 \tag{6.8}$$

$$\pi^{\langle C \rangle} - T p^{\langle C \rangle} (1 - \tau) = 0 \tag{6.9}$$

$$-CI^{\langle A \rangle} + \left(\chi^{\langle A,A \rangle} X^{\langle A,A \rangle} \gamma^{\langle A \rangle^{-1} \left(-1 + \gamma^{\langle A \rangle} \right)} + \chi^{\langle B,A \rangle} X^{\langle B,A \rangle} \gamma^{\langle A \rangle^{-1} \left(-1 + \gamma^{\langle A \rangle} \right)} + \chi^{\langle C,A \rangle} X^{\langle C,A \rangle} \gamma^{\langle A \rangle^{-1} \left(-1 + \gamma^{\langle A \rangle} \right)} \right)^{\gamma^{\langle A \rangle} \left(-1 + \gamma^{\langle A \rangle} \right)^{-1}} = 0$$

$$(6.10)$$

$$-CI^{\langle B \rangle} + \left(\chi^{\langle A,B \rangle} X^{\langle A,B \rangle} \gamma^{\langle B \rangle^{-1} \left(-1 + \gamma^{\langle B \rangle} \right)} + \chi^{\langle B,B \rangle} X^{\langle B,B \rangle} \gamma^{\langle B \rangle^{-1} \left(-1 + \gamma^{\langle B \rangle} \right)} + \chi^{\langle C,B \rangle} X^{\langle C,B \rangle} \gamma^{\langle B \rangle^{-1} \left(-1 + \gamma^{\langle B \rangle} \right)} \right)^{\gamma^{\langle B \rangle} \left(-1 + \gamma^{\langle B \rangle} \right)^{-1}} = 0$$

$$(6.11)$$

$$-CI^{\langle C \rangle} + \left(\chi^{\langle A, C \rangle} X^{\langle A, C \rangle} \gamma^{\langle C \rangle^{-1} \left(-1 + \gamma^{\langle C \rangle} \right)} + \chi^{\langle B, C \rangle} X^{\langle B, C \rangle} \gamma^{\langle C \rangle^{-1} \left(-1 + \gamma^{\langle C \rangle} \right)} + \chi^{\langle C, C \rangle} X^{\langle C, C \rangle} \gamma^{\langle C \rangle^{-1} \left(-1 + \gamma^{\langle C \rangle} \right)} \right)^{\gamma^{\langle C \rangle} \left(-1 + \gamma^{\langle C \rangle} \right)^{-1}} = 0$$

$$(6.12)$$

$$-VA^{\langle A \rangle} + \left(\beta^{k\langle A \rangle} K^{\langle A \rangle} \gamma^{\langle A \rangle^{-1} \left(-1 + \gamma^{\langle A \rangle}\right)} + \beta^{l\langle A \rangle} L^{\langle A \rangle} \gamma^{\langle A \rangle^{-1} \left(-1 + \gamma^{\langle A \rangle}\right)}\right)^{\gamma^{\langle A \rangle} \left(-1 + \gamma^{\langle A \rangle}\right)^{-1}} = 0$$

$$(6.13)$$

$$-VA^{\langle B \rangle} + \left(\beta^{k\langle B \rangle} K^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1 + \gamma^{\langle B \rangle}\right)}} + \beta^{l\langle B \rangle} L^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1 + \gamma^{\langle B \rangle}\right)}}\right)^{\gamma^{\langle B \rangle} \left(-1 + \gamma^{\langle B \rangle}\right)^{-1}} = 0 \tag{6.14}$$

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$$-VA^{\langle C \rangle} + \left(\beta^{k \langle C \rangle} K^{\langle C \rangle} \gamma^{\langle C \rangle^{-1} \left(-1 + \gamma^{\langle C \rangle}\right)} + \beta^{l \langle C \rangle} L^{\langle C \rangle} \gamma^{\langle C \rangle^{-1} \left(-1 + \gamma^{\langle C \rangle}\right)}\right)^{\gamma^{\langle C \rangle} \left(-1 + \gamma^{\langle C \rangle}\right)^{-1}} = 0$$

$$(6.15)$$

$$-Y^{\langle A \rangle} + \left(\beta^{\text{va}\langle A \rangle} V A^{\langle A \rangle^{\gamma^{\langle A \rangle} - 1} \left(-1 + \gamma^{\langle A \rangle}\right)} + \beta^{\text{ci}\langle A \rangle} C I^{\langle A \rangle^{\gamma^{\langle A \rangle} - 1} \left(-1 + \gamma^{\langle A \rangle}\right)}\right)^{\gamma^{\langle A \rangle} \left(-1 + \gamma^{\langle A \rangle}\right)^{-1}} = 0$$

$$(6.16)$$

$$-Y^{\langle B \rangle} + \left(\beta^{\text{va}\langle B \rangle} V A^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1 + \gamma^{\langle B \rangle}\right)} + \beta^{\text{ci}\langle B \rangle} C I^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1 + \gamma^{\langle B \rangle}\right)}\right)^{\gamma^{\langle B \rangle} \left(-1 + \gamma^{\langle B \rangle}\right)^{-1}} = 0$$

$$(6.17)$$

$$-Y^{\langle C \rangle} + \left(\beta^{\text{va}\langle C \rangle} V A^{\langle C \rangle^{\gamma^{\langle C \rangle} - 1} \left(-1 + \gamma^{\langle C \rangle}\right)} + \beta^{\text{ci}\langle C \rangle} C I^{\langle C \rangle^{\gamma^{\langle C \rangle} - 1} \left(-1 + \gamma^{\langle C \rangle}\right)}\right)^{\gamma^{\langle C \rangle} \left(-1 + \gamma^{\langle C \rangle}\right)^{-1}} = 0$$

$$(6.18)$$

$$\lambda^{\text{CONSUMER}^{1}} p^{\langle A \rangle} + \alpha^{\langle A \rangle} D^{\langle A \rangle^{-1+\omega^{-1}(-1+\omega)}} \left(\alpha^{\langle A \rangle} D^{\langle A \rangle^{\omega^{-1}(-1+\omega)}} + \alpha^{\langle B \rangle} D^{\langle B \rangle^{\omega^{-1}(-1+\omega)}} + \alpha^{\langle C \rangle} D^{\langle C \rangle^{\omega^{-1}(-1+\omega)}} \right)^{-1+\omega(-1+\omega)^{-1}} = 0$$

$$(6.19)$$

$$\lambda^{\text{CONSUMER}^{1}} p^{\langle \mathbf{B} \rangle} + \alpha^{\langle \mathbf{B} \rangle} D^{\langle \mathbf{B} \rangle^{-1+\omega^{-1}(-1+\omega)}} \left(\alpha^{\langle \mathbf{A} \rangle} D^{\langle \mathbf{A} \rangle^{\omega^{-1}(-1+\omega)}} + \alpha^{\langle \mathbf{B} \rangle} D^{\langle \mathbf{B} \rangle^{\omega^{-1}(-1+\omega)}} + \alpha^{\langle \mathbf{C} \rangle} D^{\langle \mathbf{C} \rangle^{\omega^{-1}(-1+\omega)}} \right)^{-1+\omega(-1+\omega)^{-1}} = 0 \tag{6.20}$$

$$\lambda^{\text{CONSUMER}^{1}} p^{\langle \mathcal{C} \rangle} + \alpha^{\langle \mathcal{C} \rangle} D^{\langle \mathcal{C} \rangle^{-1+\omega^{-1}(-1+\omega)}} \left(\alpha^{\langle \mathcal{A} \rangle} D^{\langle \mathcal{A} \rangle^{\omega^{-1}(-1+\omega)}} + \alpha^{\langle \mathcal{B} \rangle} D^{\langle \mathcal{B} \rangle^{\omega^{-1}(-1+\omega)}} + \alpha^{\langle \mathcal{C} \rangle} D^{\langle \mathcal{C} \rangle^{\omega^{-1}(-1+\omega)}} \right)^{-1+\omega(-1+\omega)^{-1}} = 0 \tag{6.21}$$

$$-p^{\langle A \rangle} (1-\tau) + \beta^{\operatorname{ci}\langle A \rangle} \chi^{\langle A, A \rangle} p^{\langle A \rangle} (1-\tau) C I^{\langle A \rangle^{-1+\gamma^{\langle A \rangle^{-1}} \left(-1+\gamma^{\langle A \rangle}\right)}} X^{\langle A, A \rangle^{-1+\gamma^{\langle A \rangle^{-1}} \left(-1+\gamma^{\langle A \rangle}\right)}} \left(\beta^{\operatorname{va}\langle A \rangle} V A^{\langle A \rangle^{\gamma^{\langle A \rangle^{-1}} \left(-1+\gamma^{\langle A \rangle}\right)}} + \beta^{\operatorname{ci}\langle A \rangle} C I^{\langle A \rangle^{\gamma^{\langle A \rangle^{-1}} \left(-1+\gamma^{\langle A \rangle}\right)}}\right)^{-1+\gamma^{\langle A \rangle} \left(-1+\gamma^{\langle A \rangle}\right)^{-1}} \left(\chi^{\langle A, A \rangle} V A^{\langle A \rangle^{\gamma^{\langle A \rangle^{-1}} \left(-1+\gamma^{\langle A \rangle}\right)}} + \beta^{\operatorname{ci}\langle A \rangle} C I^{\langle A \rangle^{\gamma^{\langle A \rangle^{-1}} \left(-1+\gamma^{\langle A \rangle}\right)}}\right)^{-1+\gamma^{\langle A \rangle} \left(-1+\gamma^{\langle A \rangle}\right)^{-1}} \left(\chi^{\langle A, A \rangle} V A^{\langle A \rangle^{\gamma^{\langle A \rangle} \left(-1+\gamma^{\langle A \rangle}\right)}} + \beta^{\operatorname{ci}\langle A \rangle} C I^{\langle A \rangle^{\gamma^{\langle A \rangle} \left(-1+\gamma^{\langle A \rangle}\right)}}\right)^{-1+\gamma^{\langle A \rangle} \left(-1+\gamma^{\langle A \rangle}\right)^{-1}} \left(\chi^{\langle A, A \rangle} V A^{\langle A \rangle} V A^{\langle A \rangle}\right)^{-1} \left(\chi^{\langle A, A \rangle} V A^{\langle A, A \rangle}\right)^{-1} \left(\chi^{\langle A, A \rangle} V A^{\langle A, A \rangle}\right)^{-1} \left(\chi^{\langle A, A \rangle} V A^{\langle A, A \rangle}\right)^{-1} \left(\chi^{\langle A, A \rangle} V A^{\langle A, A \rangle}\right)^{-1} \left(\chi^{\langle A, A \rangle} V A^{\langle A, A \rangle}\right)^{-1} \left(\chi^{\langle A, A \rangle} V A^{\langle A, A \rangle}\right)^{-1} \left(\chi^{\langle A, A$$

$$-p^{\langle A \rangle} (1-\tau) + \beta^{\operatorname{ci}^{\langle B \rangle}} \chi^{\langle A, B \rangle} p^{\langle B \rangle} (1-\tau) C I^{\langle B \rangle^{-1+\gamma^{\langle B \rangle^{-1}} \left(-1+\gamma^{\langle B \rangle}\right)}} X^{\langle A, B \rangle^{-1+\gamma^{\langle B \rangle^{-1}} \left(-1+\gamma^{\langle B \rangle}\right)}} \left(\beta^{\operatorname{va}^{\langle B \rangle}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1+\gamma^{\langle B \rangle}\right)}} + \beta^{\operatorname{ci}^{\langle B \rangle}} C I^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1+\gamma^{\langle B \rangle}\right)}}\right)^{-1+\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)^{-1}} \left(\chi^{\langle A, B \rangle} X^{\langle A, B \rangle} V A^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1+\gamma^{\langle B \rangle}\right)} + \beta^{\operatorname{ci}^{\langle B \rangle}} C I^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1+\gamma^{\langle B \rangle}\right)}}\right)^{-1+\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)^{-1}} \left(\chi^{\langle A, B \rangle} X^{\langle A, B \rangle} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} + \beta^{\operatorname{ci}^{\langle B \rangle}} C I^{\langle B \rangle^{\gamma^{\langle B \rangle^{-1}} \left(-1+\gamma^{\langle B \rangle}\right)}}\right)^{-1+\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)^{-1}} \left(\chi^{\langle A, B \rangle} X^{\langle A, B \rangle} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)} + \beta^{\operatorname{ci}^{\langle B \rangle}} C I^{\langle B \rangle} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}}\right)^{-1+\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)^{-1}} \left(\chi^{\langle A, B \rangle} X^{\langle A, B \rangle} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}} V A^{\langle B \rangle^{\gamma^{\langle B \rangle} \left(-1+\gamma^{\langle B \rangle}\right)}}$$

$$-p^{\langle A \rangle} (1-\tau) + \beta^{\operatorname{ci}\langle C \rangle} \chi^{\langle A, C \rangle} p^{\langle C \rangle} (1-\tau) C I^{\langle C \rangle^{-1+\gamma^{\langle C \rangle}-1} \left(-1+\gamma^{\langle C \rangle}\right)} X^{\langle A, C \rangle^{-1+\gamma^{\langle C \rangle}-1} \left(-1+\gamma^{\langle C \rangle}\right)} \left(\beta^{\operatorname{va}\langle C \rangle} V A^{\langle C \rangle^{\gamma^{\langle C \rangle}-1} \left(-1+\gamma^{\langle C \rangle}\right)} + \beta^{\operatorname{ci}\langle C \rangle} C I^{\langle C \rangle^{\gamma^{\langle C \rangle}-1} \left(-1+\gamma^{\langle C \rangle}\right)}\right)^{-1+\gamma^{\langle C \rangle} \left(-1+\gamma^{\langle C \rangle}\right)^{-1}} \left(\chi^{\langle A, C \rangle} X A^{\langle C \rangle^{\gamma^{\langle C \rangle}-1} \left(-1+\gamma^{\langle C \rangle}\right)} + \beta^{\operatorname{ci}\langle C \rangle} C I^{\langle C \rangle^{\gamma^{\langle C \rangle}-1} \left(-1+\gamma^{\langle C \rangle}\right)}\right)^{-1+\gamma^{\langle C \rangle} \left(-1+\gamma^{\langle C \rangle}\right)^{-1}} \left(\chi^{\langle A, C \rangle} X A^{\langle C \rangle^{\gamma^{\langle C \rangle}-1} \left(-1+\gamma^{\langle C \rangle}\right)} + \beta^{\operatorname{ci}\langle C \rangle} C I^{\langle C \rangle^{\gamma^{\langle C \rangle}-1} \left(-1+\gamma^{\langle C \rangle}\right)}\right)^{-1+\gamma^{\langle C \rangle} \left(-1+\gamma^{\langle C \rangle}\right)^{-1}} \left(\chi^{\langle A, C \rangle} X A^{\langle C \rangle} X A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} C I^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} C I^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} C I^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} A^{\langle C \rangle} + \beta^{\operatorname{ci}\langle C \rangle} A^{\langle C \rangle} A^{\langle$$

$$-p^{\langle \mathbf{B} \rangle} (1-\tau) + \beta^{\mathbf{ci}\langle \mathbf{A} \rangle} \chi^{\langle \mathbf{B}, \mathbf{A} \rangle} p^{\langle \mathbf{A} \rangle} (1-\tau) C I^{\langle \mathbf{A} \rangle^{-1} + \gamma^{\langle \mathbf{A} \rangle^{-1}} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)} X^{\langle \mathbf{B}, \mathbf{A} \rangle^{-1} + \gamma^{\langle \mathbf{A} \rangle^{-1}} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)} \left(\beta^{\mathbf{va}\langle \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle^{\gamma^{\langle \mathbf{A} \rangle^{-1}} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)}} + \beta^{\mathbf{ci}\langle \mathbf{A} \rangle} C I^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle^{-1} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)} \right)^{-1 + \gamma^{\langle \mathbf{A} \rangle} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1}} \left(\chi^{\langle \mathbf{A}, \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) + \beta^{\mathbf{ci}\langle \mathbf{A} \rangle} C I^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle^{-1} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)} \right)^{-1} \left(\chi^{\langle \mathbf{A}, \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1} \left(\chi^{\langle \mathbf{A}, \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1} \left(\chi^{\langle \mathbf{A}, \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1} \left(\chi^{\langle \mathbf{A}, \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1} \left(\chi^{\langle \mathbf{A}, \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1} \left(\chi^{\langle \mathbf{A}, \mathbf{A} \rangle} V A^{\langle \mathbf{A} \rangle} \gamma^{\langle \mathbf{A} \rangle} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right) \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1} \left(-1 + \gamma^{\langle \mathbf{A} \rangle}\right)^{-1$$

$$-p^{(15)}(1-\tau)+\beta^{cl(B)}\chi^{(11,13)}p^{(15)}(1-\tau)CI^{(15)}^{-1+\gamma^{(15)}-1}(-1+\gamma^{(15)})\chi^{(11,15)}^{-1+\gamma^{(15)}-1}(-1+\gamma^{(15)})\left(\beta^{cc(B)}VA^{(15)}\gamma^{(15)}^{-1}(-1+\gamma^{(15)})+\beta^{cl(B)}CI^{(15)}\gamma^{(15)}^{-1}(-1+\gamma^{(15)})\right)^{-1+\gamma^{(15)}(-1+\gamma^{(15)})^{-1}}\left(\chi^{(A,11)}X^{(A,11)}X^{(B,C)}-1+\gamma^{(C)}-1}(-1+\gamma^{(C)})X^{(B,C)}^{-1}X^{(B,C)}P^{(C)}(1-\tau)+\beta^{cl(C)}X^{(B,C)}P^{(C)}(1-\tau)CI^{(C)}^{-1+\gamma^{(C)}-1}(-1+\gamma^{(C)})X^{(B,C)}^{-1+\gamma^{(C)}-1}(-1+\gamma^{(C)})}\left(\beta^{cc(C)}VA^{(C)}Y^{(C)}^{-1}(-1+\gamma^{(C)})}+\beta^{cl(C)}CI^{(C)}Y^{(C)}^{-1}(-1+\gamma^{(C)})}\right)^{-1+\gamma^{(C)}(-1+\gamma^{(C)})^{-1}}\left(\chi^{(A,C)}X^{(C,C)}X^{(C)}^{-1}(-1+\gamma^{(C)})X^{(C,A)}P^{(A)}(1-\tau)CI^{(A)}^{-1+\gamma^{(A)}-1}(-1+\gamma^{(A)})}X^{(C,A)}^{-1+\gamma^{(A)}-1}(-1+\gamma^{(A)})}\left(\beta^{cc(A)}VA^{(A)}Y^{(A)}^{-1}(-1+\gamma^{(A)})}+\beta^{cl(A)}CI^{(A)}Y^{(A)}^{-1}(-1+\gamma^{(A)})}\right)^{-1+\gamma^{(A)}(-1+\gamma^{(A)})^{-1}}\left(\chi^{(A,B)}X^{(C,A)}^{-1}(-1+\gamma^{(B)})X^{(C,B)}^{-1}(-1+\gamma^{(B)})}X^{(C,B)}^{-1+\gamma^{(B)}-1}(-1+\gamma^{(B)})}\right)^{-1+\gamma^{(A)}(-1+\gamma^{(A)})}+\beta^{cl(B)}CI^{(B)}Y^{(B)}^{-1}(-1+\gamma^{(B)})}\right)^{-1+\gamma^{(A)}(-1+\gamma^{(A)})^{-1}}\left(\chi^{(A,B)}X^{(C,A)}Y^{(C)}^{-1}(-1+\gamma^{(B)})X^{(C,B)}^{-1}(-1+\gamma^{(B)})}X^{(C,B)}^{-1}(-1+\gamma^{(B)})}X^{(C,B)}^{-1}(-1+\gamma^{(B)})}\right)^{-1+\gamma^{(B)}(-1+\gamma^{(B)})^{-1}}\left(\chi^{(A,B)}X^{(C,B)}^{-1}(-1+\gamma^{(B)})X^{(C,B)}^{-1}(-1+\gamma^{(B)})}X^{(C,B)}^{-1}(-1+\gamma^{(B)})}X^{(C,B)}^{-1}(-1+\gamma^{(B)})}X^{(C,B)}^{-1}(-1+\gamma^{(B)})}\right)^{-1+\gamma^{(B)}(-1+\gamma^{(B)})^{-1}}\left(\chi^{(A,B)}X^{(C,B)}^{-1}(-1+\gamma^{(B)})X^{(C,B)}^{-1}(-1+\gamma^{(C)})}X^{(C,C)}^{-1}(-1+\gamma^{(C)})}X^{(C,C)}^{-1}(-1+\gamma^{(C)})}X^{(C,C)}^{-1}(-1+\gamma^{(C)})}X^{(C,C)}^{-1}(-1+\gamma^{(C)})^{-1}$$

 $\left(-1-t^{\mathrm{l}}\right)(1-\tau)+\beta^{\mathrm{l}\langle\mathrm{C}\rangle}\beta^{\mathrm{va}\langle\mathrm{C}\rangle}p^{\langle\mathrm{C}\rangle}\left(1-\tau\right)L^{\langle\mathrm{C}\rangle^{-1+\gamma^{\langle\mathrm{C}\rangle^{-1}}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}}VA^{\langle\mathrm{C}\rangle^{-1+\gamma^{\langle\mathrm{C}\rangle^{-1}}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}}\left(\beta^{\mathrm{k}\langle\mathrm{C}\rangle}K^{\langle\mathrm{C}\rangle^{\gamma^{\langle\mathrm{C}\rangle^{-1}}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}}+\beta^{\mathrm{l}\langle\mathrm{C}\rangle}L^{\langle\mathrm{C}\rangle^{\gamma^{\langle\mathrm{C}\rangle^{-1}}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle^{-1}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)}\right)^{-1+\gamma^{\langle\mathrm{C}\rangle}\left(-1+\gamma^{\langle\mathrm{C}\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle\mathrm{C}\rangle}VA^{\langle\mathrm{C}\rangle}\right)^{-1}$

(6.33)

$$-p^{k}\left(1+t^{k}\right)\left(1-\tau\right)+\beta^{k\langle A\rangle}\beta^{\mathrm{va}\langle A\rangle}p^{\langle A\rangle}\left(1-\tau\right)K^{\langle A\rangle^{-1+\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}}VA^{\langle A\rangle^{-1+\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}\left(\beta^{k\langle A\rangle}K^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}}+\beta^{l\langle A\rangle}L^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}}+\beta^{l\langle A\rangle}L^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}}+\beta^{l\langle A\rangle}L^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}}+\beta^{l\langle A\rangle}L^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle^{\gamma^{\langle A\rangle}}}+\beta^{l\langle A\rangle}L^{\langle A\rangle^{\gamma^{\langle A\rangle^{-1}}\left(-1+\gamma^{\langle A\rangle}\right)}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle^{\gamma^{\langle A\rangle}}}+\beta^{l\langle A\rangle}L^{\langle A\rangle^{\gamma^{\langle A\rangle}}}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle^{\gamma^{\langle A\rangle}}}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle}K^{\langle A\rangle}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle}\right)^{-1+\gamma^{\langle A\rangle}\left(-1+\gamma^{\langle A\rangle}\right)^{-1}}\left(\beta^{\mathrm{va}\langle A\rangle}K^{\langle A\rangle}\right)^{-1+\gamma^{\langle A\rangle}}\left(\beta^{\mathrm{va}\langle A\rangle}\right)^{-1+\gamma^{\langle A\rangle}}\left(\beta$$

$$-p^{\mathbf{k}}\left(1+t^{\mathbf{k}}\right)\left(1-\tau\right)+\beta^{\mathbf{k}^{\langle \mathbf{B}\rangle}}\beta^{\mathbf{v}\mathbf{a}^{\langle \mathbf{B}\rangle}}p^{\langle \mathbf{B}\rangle}\left(1-\tau\right)K^{\langle \mathbf{B}\rangle^{-1}+\gamma^{\langle \mathbf{B}\rangle^{-1}}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)}VA^{\langle \mathbf{B}\rangle^{-1}+\gamma^{\langle \mathbf{B}\rangle^{-1}}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)}\left(\beta^{\mathbf{k}^{\langle \mathbf{B}\rangle}}K^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle^{-1}}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)+\beta^{\mathbf{l}^{\langle \mathbf{B}\rangle}}L^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle^{-1}}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)\right)^{-1+\gamma^{\langle \mathbf{B}\rangle}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)^{-1}}\left(\beta^{\mathbf{v}\mathbf{a}^{\langle \mathbf{B}\rangle}}V^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle}\right)^{-1}\left(\beta^{\mathbf{b}^{\langle \mathbf{B}\rangle}}\beta^{\mathbf{b}^{\langle \mathbf{B}\rangle}}\beta^{\mathbf{b}^{\langle \mathbf{B}\rangle}}\left(1-\tau\right)K^{\langle \mathbf{B}\rangle^{-1}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)}VA^{\langle \mathbf{B}\rangle^{-1}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)}\left(\beta^{\mathbf{b}^{\langle \mathbf{B}\rangle}}K^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle^{-1}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)}+\beta^{\mathbf{l}^{\langle \mathbf{B}\rangle}}L^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle^{-1}\left(-1+\gamma^{\langle \mathbf{B}\rangle}\right)}\right)^{-1}\left(\beta^{\mathbf{b}^{\langle \mathbf{B}\rangle}}\gamma^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle}\right)^{-1}\left(\beta^{\mathbf{b}^{\langle \mathbf{B}\rangle}}\gamma^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle}\right)^{-1}\left(\beta^{\mathbf{b}^{\langle \mathbf{B}\rangle}}\gamma^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle}\right)^{-1}\left(\beta^{\mathbf{b}^{\langle \mathbf{B}\rangle}}\gamma^{\langle \mathbf{B}\rangle}\gamma^{\langle \mathbf{B}\rangle}\gamma^{\langle$$

$$-p^{k}\left(1+t^{k}\right)\left(1-\tau\right)+\beta^{k\langle C\rangle}\beta^{va\langle C\rangle}p^{\langle C\rangle}\left(1-\tau\right)K^{\langle C\rangle^{-1+\gamma\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}VA^{\langle C\rangle^{-1+\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}\left(\beta^{k\langle C\rangle}K^{\langle C\rangle^{\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}+\beta^{l\langle C\rangle}L^{\langle C\rangle^{\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}\right)^{-1+\gamma^{\langle C\rangle}\left(-1+\gamma^{\langle C\rangle}\right)^{-1}}\left(\beta^{va\langle C\rangle}K^{\langle C\rangle^{\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}+\beta^{l\langle C\rangle}L^{\langle C\rangle^{\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}\right)^{-1+\gamma^{\langle C\rangle}\left(-1+\gamma^{\langle C\rangle}\right)^{-1}}\left(\beta^{va\langle C\rangle}K^{\langle C\rangle^{\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}+\beta^{l\langle C\rangle}L^{\langle C\rangle^{\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}\right)^{-1+\gamma^{\langle C\rangle}\left(-1+\gamma^{\langle C\rangle}\right)^{-1}}\left(\beta^{va\langle C\rangle}K^{\langle C\rangle^{\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}+\beta^{l\langle C\rangle}L^{\langle C\rangle^{\gamma^{\langle C\rangle^{-1}}\left(-1+\gamma^{\langle C\rangle}\right)}}\right)^{-1+\gamma^{\langle C\rangle}\left(-1+\gamma^{\langle C\rangle}\right)^{-1}}\left(\beta^{va\langle C\rangle}K^{\langle C\rangle^{\gamma^{\langle C\rangle}}\left(-1+\gamma^{\langle C\rangle}\right)}+\beta^{l\langle C\rangle}L^{\langle C\rangle^{\gamma^{\langle C\rangle}}\left(-1+\gamma^{\langle C\rangle}\right)}\right)^{-1+\gamma^{\langle C\rangle}\left(-1+\gamma^{\langle C\rangle}\right)}$$

$$-T^{\rm lk} + t^{\rm l} \left(L^{\langle {\rm A} \rangle} + L^{\langle {\rm B} \rangle} + L^{\langle {\rm C} \rangle} \right) + t^{\rm k} p^{\rm k} \left(K^{\langle {\rm A} \rangle} + K^{\langle {\rm B} \rangle} + K^{\langle {\rm C} \rangle} \right) = 0 \tag{6.37}$$

$$-G^{\rm inc} + T^{\rm hh} + T^{\rm firms} + T^{\rm lk} = 0 ag{6.38}$$

$$-H^{\rm inc} + L + TR + p^{\mathbf{k}}K = 0 (6.39)$$

$$-K + K^{\langle A \rangle} + K^{\langle B \rangle} + K^{\langle C \rangle} = 0 \tag{6.40}$$

$$D^{\langle A \rangle} + X^{\langle A, A \rangle} + X^{\langle A, B \rangle} + X^{\langle A, C \rangle} - Y^{\langle A \rangle} = 0 \tag{6.41}$$

$$D^{\langle \mathrm{B} \rangle} + X^{\langle \mathrm{B}, \mathrm{A} \rangle} + X^{\langle \mathrm{B}, \mathrm{B} \rangle} + X^{\langle \mathrm{B}, \mathrm{C} \rangle} - Y^{\langle \mathrm{B} \rangle} = 0 \tag{6.42}$$

$$D^{\langle C \rangle} + X^{\langle C, A \rangle} + X^{\langle C, B \rangle} + X^{\langle C, C \rangle} - Y^{\langle C \rangle} = 0 \tag{6.43}$$

$$-\pi^{\langle A \rangle} - \pi^{\langle B \rangle} - \pi^{\langle C \rangle} - H^{\text{inc}} \left(1 - \tau^{\text{h}} \right) + p^{\langle A \rangle} D^{\langle A \rangle} + p^{\langle B \rangle} D^{\langle B \rangle} + p^{\langle C \rangle} D^{\langle C \rangle} = 0$$

$$(6.44)$$

$$-Tpi^{\langle A \rangle} - p^{\langle A \rangle}X^{\langle A,A \rangle} + p^{\langle A \rangle}Y^{\langle A \rangle} - p^{\langle B \rangle}X^{\langle B,A \rangle} - p^{\langle C \rangle}X^{\langle C,A \rangle} - L^{\langle A \rangle}(1+t^{l}) - p^{k}K^{\langle A \rangle}(1+t^{k}) = 0$$

$$(6.45)$$

$$-Tp^{\langle \mathrm{B} \rangle} - p^{\langle \mathrm{A} \rangle} X^{\langle \mathrm{A}, \mathrm{B} \rangle} - p^{\langle \mathrm{B} \rangle} X^{\langle \mathrm{B}, \mathrm{B} \rangle} + p^{\langle \mathrm{B} \rangle} Y^{\langle \mathrm{B} \rangle} - p^{\langle \mathrm{C} \rangle} X^{\langle \mathrm{C}, \mathrm{B} \rangle} - L^{\langle \mathrm{B} \rangle} \left(1 + t^{\mathrm{I}} \right) - p^{\mathrm{k}} K^{\langle \mathrm{B} \rangle} \left(1 + t^{\mathrm{k}} \right) = 0 \tag{6.46}$$

$$-Tpi^{\langle C \rangle} - p^{\langle A \rangle} X^{\langle A,C \rangle} - p^{\langle B \rangle} X^{\langle B,C \rangle} - p^{\langle C \rangle} X^{\langle C,C \rangle} + p^{\langle C \rangle} Y^{\langle C \rangle} - L^{\langle C \rangle} (1+t^{l}) - p^{k} K^{\langle C \rangle} (1+t^{k}) = 0$$

$$(6.47)$$

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7 Parameter settings

$$t^{\mathbf{k}} = 0 \tag{7.1}$$

$$t^{\mathbf{l}} = 0 \tag{7.2}$$

$$\tau^{\rm h} = 0 \tag{7.3}$$

$$\tau = 0 \tag{7.4}$$

8 Equilibrium values

	Equilibrium value
$\lambda^{\text{CONSUMER}^1}$	-0.9978
$p^{ m k}$	1.0001
$G^{ m inc}$	0
$H^{ m inc}$	80.0057
K	40
L	40
$T^{ m hh}$	0
$T^{ m firms}$	0
$T^{ m lk}$	0
TR	0
U	79.8271
$p^{\langle { m A} angle}$	1.0013
$p^{\langle \mathrm{B} angle}$	1.0026
$p^{\langle \mathrm{C} angle}$	1.0023
$\pi^{\langle { m A} angle}$	0
$\pi^{\langle \mathrm{B} angle}$	0
$\pi^{\langle \mathrm{C} angle}$	0
$CI^{\langle { m A} angle}$	39.8256
$CI^{\langle \mathrm{B} angle}$	29.8056
$CI^{\langle \mathrm{C} \rangle}$	49.6959
$D^{\langle { m A} angle}$	29.9529
$D^{ m \langle B angle}$	9.997
$D^{\langle \mathrm{C} angle}$	39.9004
$K^{\langle { m A} angle}$	19.9931
$K^{\langle \mathrm{B} angle}$	9.9852
$K^{ m \langle C angle}$	10.0217
$L^{\langle { m A} angle}$	9.9994
$L^{ m \langle B angle}$	19.9761
$L^{ m \langle C angle}$	10.0245
$\stackrel{-}{Tpi}^{\langle { m A} angle}$	0
$Tpi^{\langle \mathrm{B} angle}$	0
$Tpi^{\langle \mathrm{C} \rangle}$	0
$VA^{\langle { m A} angle}$	29.9561
$VA^{\langle \mathrm{B} \rangle}$	
$VA^{\langle C \rangle}$	29.9249
$X^{\langle A,A \rangle}$	20.0401
$X^{\langle \mathrm{A},\mathrm{B} \rangle}$	9.9763
$X^{\langle -1,-1 \rangle}$ $X^{\langle A,C \rangle}$	9.9615
$X^{\langle \mathrm{B},\mathrm{A} \rangle}$	19.9301
$X^{\langle \mathrm{B},\mathrm{B}\rangle}$	19.8974
$X^{\langle \mathrm{B,C} \rangle}$	9.937
$X^{\langle C,A \rangle}$	19.881
$X^{\langle C,B\rangle}$	9.958
$X^{\langle \mathrm{C}, \mathrm{C} angle} $	9.9433
$X^{\langle C, C angle}$ $Y^{\langle A angle}$	9.9516
$Y^{\langle \mathrm{B} angle}$	69.8208
$Y^{\langle \mathrm{C} \rangle}$	59.7124
$Y \stackrel{\smile}{\sim}$	69.7533

9 Equilibrium values

	Equilibrium value
$\lambda^{\text{CONSUMER}^1}$	-0.9978
p^{k}	0.8001
$\overset{r}{G}^{\mathrm{inc}}$	8.0011
$H^{ m inc}$	80.0057
K	40
L	40
$T^{ m hh}$	0
$T^{ m firms}$	0
$T^{ m lk}$	8.0011
TR	8.0011
U	79.8271
$p^{\langle \mathrm{A} angle}$	1.0013
$p^{ m \langle B angle}$	1.0026
$p^{\langle \mathrm{C} angle}$	1.0023
$\pi^{\langle { m A} angle}$	0
$\pi^{\langle \mathrm{B} angle}$	0
$\pi^{\langle \mathrm{C} angle}$	0
$CI^{\langle { m A} angle}$	39.8256
$CI^{\langle \mathrm{B} angle}$	29.8056
$CI^{\langle \mathrm{C} \rangle}$	49.6958
$D^{\langle { m A} angle}$	29.9529
$D^{ m \langle B angle}$	9.997
$D^{\langle \mathrm{C} angle}$	39.9004
$K^{\langle { m A} angle}$	19.9931
$K^{\langle \mathrm{B} angle}$	9.9852
$K^{\langle \mathrm{C} angle}$	10.0217
$L^{\langle { m A} angle}$	9.9994
$L^{\langle \mathrm{B} angle}$	9.9994 19.9761
$L^{\langle ext{C} angle}$	19.9761 10.0245
$Tpi^{\langle { m A} angle}$	0
$Tpi^{\langle \mathrm{B} angle}$	-
$Ip^{(-)}$	0
$Tpi^{\langle C \rangle}$	0
$VA^{\langle A \rangle}$	29.9561
$VA^{\langle \mathrm{B} \rangle}$	29.9249
$VA^{\langle \mathrm{C} \rangle}$	20.0401
$X^{\langle A,A \rangle}$	9.9763
$X^{\langle ext{A,B} angle}$	9.9615
$X^{\langle \mathrm{A,C} \rangle}$	19.9301
$X^{\langle \mathrm{B,A} \rangle}$	19.8974
$X^{\langle \mathrm{B,B} angle}$	9.937
$X^{\langle \mathrm{B,C} angle}$	19.881
$X^{\langle \mathrm{C,A} \rangle}$	9.958
$X^{ m \langle C,B angle}$	9.9433
$X^{\langle ext{C,C} angle}$	9.9516
$Y^{\langle \mathrm{A} angle}$	69.8208
$Y^{\langle \mathrm{B} angle}$	59.7124
$Y^{\langle \mathrm{C} angle}$	69.7533