

$$\begin{aligned}
& \stackrel{?}{=} \epsilon c_{DSCSP} S_i s_i 0 \leq \\
& \stackrel{1S_i}{\leq} \phi = \\
& 0\phi = \\
& \stackrel{1}{1} \stackrel{qp}{S} = \\
& \{s_i = \\
& (x_i, p v_i, p c_i)\}_{i=1}^N N p v p c x_i p c 0 \leq \\
& \stackrel{n}{1} \stackrel{\eta_c}{\eta_c} \cdot \\
& \stackrel{n}{\epsilon^n} \cdot \\
& \stackrel{pcd}{pc} \cdot \\
& S_i h(S_i) x h x h(x) q_h(x) \\
& S_i n_i h(S_i) q(S_i) q(x) x q(x) > \\
& 0 q(x) < \\
& \emptyset d o_i \}_{i=1}^m \\
& \{s c_j\}_{j=1}^n \\
& \stackrel{\epsilon}{\epsilon} \\
& p_{d o_i}(\epsilon) \quad i \\
& g_{d o_i}(\epsilon) \quad i \\
& \stackrel{p}{p} \\
& q_i(\epsilon) \\
& f_j(q) \quad j \\
& d_j(q) \quad j \\
& \stackrel{q}{q} \\
& \stackrel{j}{j} \\
& d
\end{aligned}$$

$$(1) \quad U_j(p, q, d) = q \cdot f_j(d, q) - p \cdot d$$

$$f_j() f_j(d, q)$$

$$(2) \quad q \cdot f'_j(d) - p = 0$$

$$d_j = \max\{0, \arg \max_d f'^{-1}_j(p/q)\}$$

$$(3)$$

$$(4) \quad d_j(p, q) = \max\{0, f'^{-1}_j(p/q)\}$$

$$\stackrel{p \cdot}{d_j} \pi_j$$

$$(5) \quad r_{SP}(p, q) = p \cdot \sum_j \pi_j \cdot d_j$$

$$s_{d o_i}^h s_{d o_i}^m s_{SP}^t$$

$$s_{SP}^v u_{d o_i}(x, y) u_{SP}(x, y) p_{d o_i}^h p_{d o_i}^m p_{SP}^t p_{SP}^v$$

$$(6) \quad U_{d o_i}(p_{d o_i}, p_{SP}) = p_{d o_i}^h \cdot u_{d o_i}(s_{d o_i}^h, s_{SP}^b) + p_{d o_i}^m \cdot u_{d o_i}(s_{d o_i}^m, s_{SP}^b)$$

$$(7) \quad U_{d o_i}(p_{d o_i}, p_{SP}) = p_{d o_i}^h \cdot u_{d o_i}(s_{d o_i}^h, s_{SP}^v) + p_{d o_i}^m \cdot u_{d o_i}(s_{d o_i}^m, s_{SP}^v)$$

$$(8) \quad U_{SP}(p_{d o_i}, p_{SP}) = p_{SP}^t \cdot u_{SP}(s_{d o_i}^h, s_{SP}^t) + p_{SP}^v \cdot u_{SP}(s_{d o_i}^h, s_{SP}^v)$$

$$(9) \quad U_{SP}(p_{d o_i}, p_{SP}) = p_{SP}^t \cdot u_{SP}(s_{d o_i}^h, s_{SP}^t) + p_{SP}^v \cdot u_{SP}(s_{d o_i}^h, s_{SP}^v)$$

$$\epsilon g() \stackrel{i}{i}$$

$$(10) \quad u_{d o_i}(s_{d o_i}^h, s_{SP}^b) = p_{d o_i} - g(\epsilon)$$

$$(11) \quad u_{SP}(s_{d o_i}^h, s_{SP}^b) = r_{SP}(p, q) - p_{d o_i}$$

$$\stackrel{i}{r_{SP}(p, q)}$$