$$\frac{h_{i,t} - h_{i,t-1}}{\Delta T} = \left(es_{i,t} + \sum_{j}^{m} o_{j,t}^{in} - inf_{i,t} - o_{i,t}^{out} \right)$$

$$\frac{h_{i,t} - h_{i,t-1}}{\Delta T} = \left(es_{i,t} + \sum_{j}^{m} a_j h_{j,t}^{b_j} - inf_{i,t} - a_i h_{i,t}^{b_i} \right)$$

$$h_{i,t} - \Delta T es_{i,t} - \Delta T \sum_{j}^{m} a_j h_{j,t}^{b_j} + \Delta T inf_{i,t} + \Delta T a_i h_{i,t}^{b_i} = h_{i,t-1}$$

$$h_{i,t} - \Delta T \sum_{j}^{m} a_j h_{j,t}^{b_j} + \Delta T a_i h_{i,t}^{b_i} = h_{i,t-1} + \Delta T es_{i,t} - \Delta T inf_{i,t}$$

$$h_{i,t} + \Delta T a_i h_{i,t}^{b_i} - \Delta T \sum_{j}^{m} a_j h_{j,t}^{b_j} = h_{i,t-1} + \Delta T es_{i,t} - \Delta T inf_{i,t}$$

$$h_{i,t} + \Delta T a_i h_{i,t}^{b_i - 1} h_{i,t} - \Delta T \sum_{j}^{m} a_j h_{j,t}^{b_j - 1} h_{j,t} = h_{i,t-1} + \Delta T es_{i,t} - \Delta T inf_{i,t}$$

$$(1 + \Delta T a_i h_{i,t}^{b_i - 1}) h_{i,t} - \Delta T \sum_{j}^{m} a_j h_{j,t}^{b_j - 1} h_{j,t} = h_{i,t-1} + \Delta T es_{i,t} - \Delta T inf_{i,t}$$

$$pro\ i = 5\ a\ m \in \{7, 8, 9\}$$

$$(1 + \Delta T a_5 h_{5,t}^{b_5 - 1}) h_{5,t} - \Delta T (a_7 h_{7,t}^{b_7 - 1} h_{7,t} + a_8 h_{8,t}^{b_8 - 1} h_{8,t} + a_9 h_{9,t}^{b_9 - 1} h_{9,t}) = h_{5,t-1} + \Delta T es_{5,t} - \Delta T inf_{5,t}$$

$$(1 + \Delta T a_5 h_{5,t}^{b_5 - 1}) h_{5,t} - \Delta T a_7 h_{7,t}^{b_7 - 1} h_{7,t} + \Delta T a_8 h_{8,t}^{b_8 - 1} h_{8,t} + \Delta T a_9 h_{9,t}^{b_9 - 1} h_{9,t} = h_{5,t-1} + \Delta T es_{5,t} - \Delta T inf_{5,t}$$

$$\begin{bmatrix} \dots \\ \dots \quad 1 + \Delta T a_5 h_{5,t}^{b_5 - 1} \quad \dots \quad \Delta T a_7 h_{7,t}^{b_7 - 1} \quad \Delta T a_8 h_{8,t}^{b_8 - 1} \quad \Delta T a_9 h_{9,t}^{b_9 - 1} \quad \dots \\ \dots \\ \dots \\ \dots \\ \dots \end{bmatrix} \begin{bmatrix} \vdots \\ h_{5,t} \\ \vdots \\ h_{7,t} \\ h_{8,t} \\ h_{9,t} \\ \vdots \end{bmatrix} = \begin{bmatrix} \vdots \\ h_{5,t-1} + \Delta T es_{5,t} - \Delta T inf_{5,t} \\ \vdots \\ \vdots \\ \vdots \\ \vdots \\ \vdots \end{bmatrix} \tag{1}$$

rejhy

$$h_{sh} = \min(h, h_{crit})$$
$$h_{rl} = \max(h - h_{crit}, 0)$$
$$q_{rl} = 1/nR(h)^{2/3} i^{1/2}$$

$$\frac{h_{i,t} - h_{i,t-1}}{\Delta T} = es_{i,t} + \sum_j^n a_j h_{sh,j,t}^{b_j} + \sum_k^m 1/n_k R_k (h_{rl,k,t})^{2/3} i_k^{1/2} - inf_{i,t} - a_i h_{sh,i,t}^{b_i} - 1/nR(h_{rl,i,t})^{2/3} i^{1/2}$$

ryhy i plosny

$$\frac{h_{i,t} - h_{i,t-1}}{\Delta T} = es_{i,t} + \sum_j^n a_j \min(h_{j,t}, h_{crit,j})^{b_j} + \sum_k^m 1/n_k R_k (\max(h_{k,t} - h_{crit,k}, 0))^{2/3} i_k^{1/2} - \\ - inf_{i,t} - a_i \min(h_{i,t}, h_{crit,i})^{b_i} - 1/nR(\max(h_{i,t} - h_{crit,i}, 0))^{2/3} i_i^{1/2} \quad (2)$$

Jakoby jen pokud nastanou rejhy, jinak ta bunka resi rovnici predtim (tu jen bez ryh)

$$\frac{h_{i,t} - h_{i,t-1}}{\Delta T} = es_{i,t} + \sum_j^n a_j h_{crit,j}^{b_j} + \sum_k^m 1/n_k R_k (h_{k,t} - h_{crit,k})^{2/3} i_k^{1/2} - inf_{i,t} - a_i h_{crit,i}^{b_i} - 1/n_i R_i (h_{i,t} - h_{crit,i})^{2/3} i_i^{1/2}$$

$$\frac{h_{i,t}}{\Delta T} + 1/n_i R_i (h_{i,t} - h_{crit,i})^{2/3} i_i^{1/2} - \sum_k^m 1/n_k R_k (h_{k,t} - h_{crit,k})^{2/3} i_k^{1/2} = \frac{h_{i,t-1}}{\Delta T} + es_{i,t} + \sum_j^n a_j h_{crit,j}^{b_j} - inf_{i,t} - a_i h_{crit,i}^{b_i}$$

nasobim 1 jako $h_{i,t}/h_{i,t}$ nebo $h_{k,t}/h_{k,t}$, dle potreby

$$\frac{h_{i,t}}{\Delta T} + 1/n_i R_i (h_{i,t} - h_{crit,i})^{2/3} i_i^{1/2} \frac{h_{i,t}}{h_{i,t}} - \sum_k^m 1/n_k R_k (h_{k,t} - h_{crit,k})^{2/3} i_k^{1/2} \frac{h_{k,t}}{h_{k,t}} = \frac{h_{i,t-1}}{\Delta T} + es_{i,t} + \sum_j^n a_j h_{crit,j}^{b_j} - inf_{i,t} - a_i h_{crit,i}^{b_i}$$

$$\left(\frac{1}{\Delta T} + 1/n_i R_i (h_{i,t} - h_{crit,i})^{2/3} i_i^{1/2} \frac{1}{h_{i,t}} \right) h_{i,t} - \sum_k^m \left(1/n_k R_k (h_{k,t} - h_{crit,k})^{2/3} i_k^{1/2} \frac{1}{h_{k,t}} \right) h_{k,t} = \\ \frac{h_{i,t-1}}{\Delta T} + es_{i,t} + \sum_j^n a_j h_{crit,j}^{b_j} - inf_{i,t} - a_i h_{crit,i}^{b_i} \quad (3)$$

vysledny set

pro $h <= h_{crit}$:

$$\left(\frac{1}{\Delta T} + a_i h_{i,t}^{b_i - 1}\right) h_{i,t} - \sum_j^m a_j h_{j,t}^{b_j - 1} h_{j,t} = \frac{h_{i,t-1}}{\Delta} + es_{i,t} - inf_{i,t} \tag{4}$$

pro $h > h_{crit}$:

$$\left(\frac{1}{\Delta T} + 1/n_i R_i (h_{i,t} - h_{crit,i})^{2/3} i_i^{1/2} \frac{1}{h_{i,t}}\right) h_{i,t} - \sum_k^m \left(1/n_k R_k (h_{k,t} - h_{crit,k})^{2/3} i_k^{1/2} \frac{1}{h_{k,t}}\right) h_{k,t} =$$

$$\frac{h_{i,t-1}}{\Delta T} + es_{i,t} + \sum_j^n a_j h_{crit,j}^{b_j} - inf_{i,t} - a_i h_{crit,i}^{b_i} \tag{5}$$