Starting from the Minorization-Maximization Formula

$$\gamma_i = \frac{W_i}{\sum_{j=1}^{N} \frac{C_{ij}}{E_j}} \, ,$$

we get

$$\gamma_i \cdot \sum_{j=1}^{N} \frac{C_{ij}}{E_j} = W_i \, .$$

We add an additional game $M = N + 1$ with W_i^M beeing the number of wins of player i in this game. In the standard game this can be 1 or 0, as we usually only take one winner and a number of loosers. With this definition

$$\gamma_i^M = \frac{W_i + W_i^M}{\sum_{j=1}^{N} \frac{C_{ij}}{E_j} + \frac{C_{iM}}{E_M}} \, ,$$

with the definition $A_i = \sum_{j=1}^{N} \frac{C_{ij}}{E_j}$ the result is

$$\gamma_i^M = \frac{A_i \gamma_i + W_i^M}{A_i + \frac{C_{iM}}{E_M}} \, ,$$

calling $r = W_i^M$ and $x = \frac{C_{iM}}{E_M}$

$$\gamma_i^M = \frac{A_i \gamma_i + r}{A_i + x} \, ,$$

we can argue that after a number of games r $\ll A_i \gamma_i$ and $x \ll A_i$. Therefor a Taylor series gives

$$\gamma_i^M = \gamma_i - \frac{\gamma_i}{A_i} x + \frac{1}{A_i} r \, .$$

The value of A_i depends on how many games allready played. As it is proportional to typical values of x it might be a good approach if one introduces

$$Bx = A_i \, ,$$

with B being constant, if one has no way to get exact values of A_i:

$$\gamma_i^M = \gamma_i - \frac{\gamma_i}{B} + \frac{1}{B} \frac{r}{x} \, ,$$

or written differently

$$\gamma_i^M = \gamma_i + \frac{1}{B} \left(\frac{r}{x} - \gamma_i \right) \, .$$

In the program

$$\frac{1}{B} = params-> learn\_delta \, ,$$

$$C_{iM} \cdot \gamma_i = C\_iM\_gamm\_i \, ,$$

$$E_M = sum\_gammas\,.$$

giving

$$\gamma_i^M = \gamma_i + \frac{1}{B}\left(\frac{r \cdot sum\_gammas_M \cdot \gamma_i}{C\_iM\_gamm\_i} - \gamma_i\right)\,.$$