$$f_i = BE_i^{spd} Pr_{spd} + \sum_{j=1}^{N} BE_{ij} Pr_{pd} - \sum_{j=1}^{N} SE_{ij}(Pr_{pd} + Pr_{ij}). \tag{1}$$

$$\begin{aligned} F = \sum_{i=1}^{N} f_i = \sum_{i=1}^{N} BE_i^{spd} Pr_{spd} + \sum_{i=1}^{N}\sum_{j=1}^{N} BE_{ij} Pr_{pd} - \sum_{i=1}^{N}\sum_{j=1}^{N} SE_{ij}(Pr_{pd} + Pr_{ij}) \\ = \sum_{i=1}^{N} BE_i^{spd} Pr_{spd} - \sum_{i=1}^{N}\sum_{j=1}^{N} SE_{ij} Pr_{ij} \\ = \sum_{i=1}^{N} BE_i^{spd} Pr_{spd} - \sum_{i=1}^{N}\sum_{j=1}^{N} BE_{ij} Pr_{ij} \qquad (2) \\ subject\ to: \sum_{i=1}^{N} BE_i^{spd} + \sum_{i=1}^{N}\sum_{j=1}^{N} BE_{ij} = E_0 \\ \sum_{j=1}^{N} SE_{ij} \leq (RE_i + PE_i) - CE_i^s \qquad (3) \\ \sum_{i=1}^{N}\sum_{j=1}^{N} SE_{ij} \leq \sum_{i=1}^{N}(RE_i + PE_i) - CE_i^s \qquad (4) \end{aligned}$$

Equation (2) would have:

$$\begin{aligned} F &= (E_0 - \sum_{i=1}^{N}\sum_{j=1}^{N} BE_{ij}) Pr_{spd} - \sum_{i=1}^{N}\sum_{j=1}^{N} BE_{ij} Pr_{ij} \\ &= E_0 Pr_{spd} - \sum_{i=1}^{N}\sum_{j=1}^{N} BE_{ij}(Pr_{spd} + Pr_{ij}) \qquad (5) \end{aligned}$$

Therefore:

$$\begin{aligned} Min\ F &= Min\ (E_0 Pr_{spd} - \sum_{i=1}^{N}\sum_{j=1}^{N} BE_{ij}(Pr_{spd} + Pr_{ij})) \qquad (6) \\ &= E_0 Pr_{spd} - Max\ \sum_{i=1}^{N}\sum_{j=1}^{N} BE_{ij}(Pr_{spd} + Pr_{ij}) \\ &= E_0 Pr_{spd} - Max\ \sum_{j=1}^{N}\sum_{i=1}^{N} SE_{ji}(Pr_{spd} + Pr_{ji}) \qquad (7) \end{aligned}$$

According to (4), equation (7) would have a mininum if and only if:

$$\sum_{i=1}^{N}\sum_{j=1}^{N} SE_{ij} = \sum_{i=1}^{N}(RE_i + PE_i) - CE_i^s \tag{8}$$