Fig-2-equations

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Cooperation

$$E^* = \frac{\delta(\gamma_{s,2} + \gamma_{s,1})}{\gamma_{s,1}\gamma_{e,2}}$$

$$S^* = \frac{\delta}{\gamma_{s,1}}$$

$$gen^* = \frac{(-\delta\gamma_{e,2}\gamma_{s,1}) + (1+\kappa_e)\mu_e(\delta(\gamma_{s,2} - \gamma_{s,1}) + (\gamma_{e,2}\gamma_{s,1}R))}{\gamma_{e,2}\gamma_{s,1}\zeta_{e,2}}$$

$$sp^* = \frac{(\gamma_{e,2}\gamma_{s,1}R((1+\kappa_s)\mu_s\zeta_{e,2} - (1+\kappa_e)\mu_e\zeta_{s,2}) - \delta(\gamma_{e,2}(1+\kappa_s)\mu_s\zeta_{e,2} + \gamma_{e,2}\gamma_{s,1}(\zeta_{e,2} - \zeta_{s,2}) + (\gamma_{s,2} - \gamma_{s,1})(1+\kappa_e)\mu_e\zeta_{s,2}))}{\gamma_{e,2}\gamma_{s,1}\zeta_{e,2}\zeta_{s,1}}$$

Competition

$$E^* = \frac{\delta \times (\gamma_{s,2} + \gamma_{s,1})}{\gamma_{s,1} \times \gamma_{e,2}}$$

$$S^* = \frac{\delta}{\gamma_{s,1}}$$

$$gen^* = \frac{(-\delta \times ((-\gamma_{s,2} + \gamma_{s,1}) \times (\mu_e + \gamma_{e,2} \times (\gamma_{s,1} + \beta_{e,s} \times \mu_e)) + (\gamma_{e,2} \times \gamma_{s,1} \times \mu_e \times R))}{\gamma_{e,2} \times \gamma_{s,1} \times \zeta_{e,2}}$$

$$sp^* = \frac{(\gamma_{e,2} \times \gamma_{s,1} \times R \times (\mu_s \times \zeta_{e,2} - \mu_e \times \zeta_{s,2}) + \delta \times (\gamma_{s,2} - \gamma_{s,1}) \times (\beta_{s,e} \times \mu_s \times \zeta_{e,2} - \mu_e \times \zeta_{s,2}) + \delta \times \gamma_{e,2} \times (-\mu_s \times \zeta_{e,2} + \beta_{e,s} \times \mu_e \times \zeta_{s,2} + \gamma_{s,1} \times (-\zeta_{e,2} + \zeta_{s,2}))}{\gamma_{e,2} \times \gamma_{s,1} \times \zeta_{e,2} \times \zeta_{s,1}}$$